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Structural Analysis Report

Structure	:	**150 ft Monopole**
ATC Site Name	:	**Woods Chapel, MO**
ATC Site Number	:	**306042**
Engineering Number	:	**OAA720732_C3_01**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**Woods Chapel**
Carrier Site Number	:	**KS4070**
Site Location	:	**1204 N.e. Woods Chapel Road** **Lees Summit, MO 64064-1989** **38.983200,-94.350100**
County	:	**Jackson**
Date	:	**January 11, 2018**
Max Usage	:	**94%**
Result	:	**Pass**

Prepared By:
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Structural Engineer I

Reviewed By:

STATE OF MISSOURI
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PROFESSIONAL ENGINEER

Jan 11 2018 4:46 PM cosign

COA: 2006031326

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 150 ft monopole to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	Valmont Drawing #DC2215Z, dated March 3, 1995
Foundation Drawing	Valmont Drawing #2721, dated March 8, 1995
Geotechnical Report	Terracon Project #02955036, dated February 24, 1995

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	90 mph (3-Second Gust, Vasd) / 115 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	40 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.11, S_1 = 0.07
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	152.0	3	Powerwave TT08-19DB111-001	Platform w/ Handrails	(2) 0.78" 8 AWG 6 (12) 1 5/8" Coax (1) 3/8" RET Control Cable (1) 0.39" Fiber Trunk (1) 2" Conduit	AT&T Mobility
		1	Raycap DC6-48-60-18-8F(32.8 lbs)			
		6	Andrew ETD819G-12UB			
		3	AlcatelLucent RRH2X60-1900A-4R			
		3	Alcatel-Lucent RRH4X25-WCS			
		2	Powerwave P65-16-XLH-RR			
		3	CSS XDUO6-80-R			
136.0	136.0	3	Commscope CBC78-DF-2X	Low Profile Platform	(13) 1 5/8" Coax (2) 1 1/4" Hybriflex	Verizon
		3	Commscope TMA-T-DB78-DD-A			
		2	RFS DB-B1-6C-12AB-0Z			
		3	Ericsson RRUS B13 w/ RRUS A2			
		3	Ericsson AIR 32 (57" Height)			
		3	Kathrein 800 10510V01			
		6	Andrew LNX-6515DS-A1M			
132.0	132.0	3	Andrew ETW200VS12UB	Platform w/ Handrails	(6) 1 5/8" Coax (6) 7/8" Coax (1) 1 5/8" Fiber	T-Mobile
		3	Nokia FRIG w/o Solar Shield			
		3	Nokia FHFB			
		1	Raycap ASU9338TYP01			
		3	Andrew TMBX-6517-R2M w/ Act.			
		6	Andrew TMBXX-6517-A2M w/ Act.			
122.0	122.0	9	48" x 12" Panel	Platform w/ Handrails	(12) 1 5/8" Coax	Sprint Nextel
115.0	115.0	2	DragonWave Horizon DUO	Side Arms	(5) 1/2" Coax (3) 5/16" Coax (1) 2" Conduit	Clearwire
		3	Samsung 2.5GHz nRRHv2			
		3	Argus LLPX310R			
		2	Andrew VHLP2.5			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
152.0	152.0	2	Commscope SBNHH-1D65C	-	-	AT&T Mobility
		3	Andrew SBNHH-1D85B			
		1	Powerwave P65-16-XLH-RR			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	152.0	1	Raycap DC6-48-60-0-8C	Platform w/ Handrails	(2) 0.78" 8 AWG 6	AT&T Mobility
		3	Alcatel-Lucent RRH2x40W-07L (700)			
		3	CSS XDUO6-80-R			
		2	Powerwave P65-17-XLH-RR			
		3	Commscope JAH4-65C-R4			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	94%	Pass
Shaft	56%	Pass
Base Plate	49%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	4,153.3	67%
Axial (Kips)	109.2	3%
Shear (Kips)	40.1	63%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
150.0	Raycap DC6-48-60-0-8C	AT&T Mobility	1.506	1.051
	Alcatel-Lucent RRH2x40W-07L (700)			
	CSS XDUO6-80-R			
	Powerwave Allgon P65-17-XLH-RR			
	Commscope JAH4-65C-R4			
115.0	Andrew VHLP2.5	Clearwire	0.891	0.917
	Andrew VHLP2.5			

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

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Standard Conditions

All engineering services performed by ATC Tower Services are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

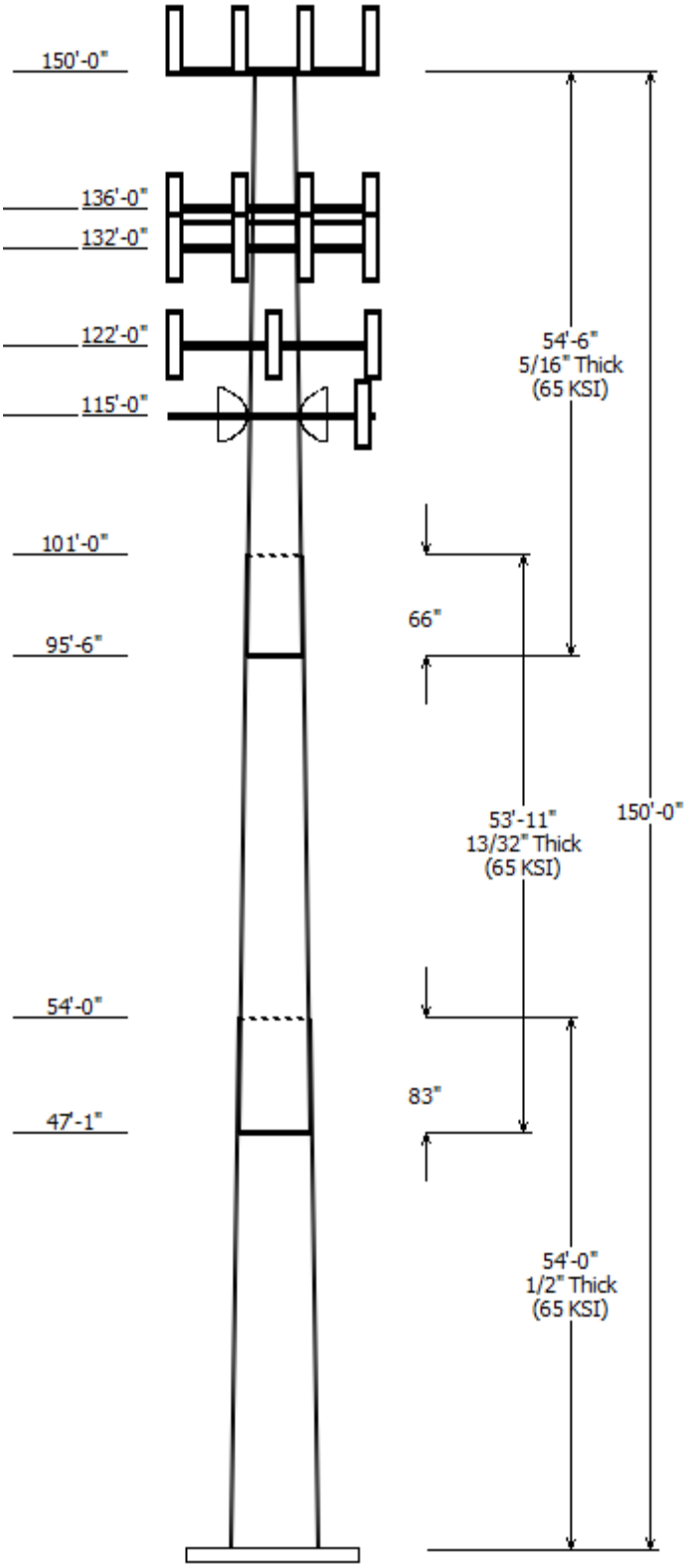
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of ATC Tower Services

It is the responsibility of the client to ensure that the information provided to ATC Tower Services and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and ATC Tower Services , all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Tower Services is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Job Information

Pole :	306042	Code:	ANSI/TIA-222-G
Location :	Woods Chapel, MO		
Description :	150 ft Valmont Monopole		
Client :	AT&T MOBILITY	Struct Class :	II
Shape :	12 Sides	Exposure :	C
Height :	150.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.247981 (in/ft)		

Sections Properties

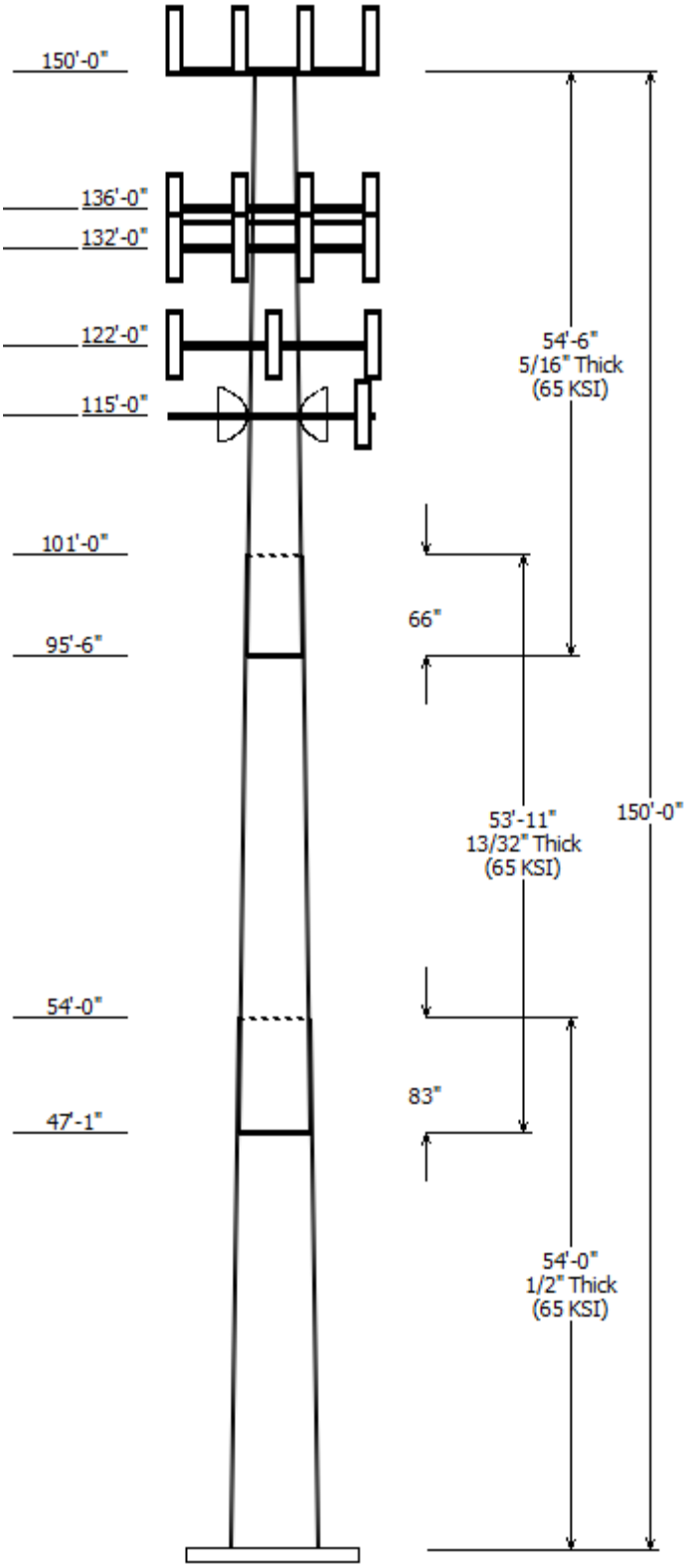
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Steel Grade Shape	(ksi)
1	54.000	47.10	60.50	0.500		0.000	Round	65
2	53.917	36.26	49.63	0.406	Slip Joint	83.000	Round	65
3	54.500	24.74	38.25	0.313	Slip Joint	66.000	Round	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
150.000	152.000	1	Raycap DC6-48-60-0-8C
150.000	152.000	3	Commscope JAH4-65C-R4
150.000	152.000	2	Powerwave Allgon P65-17-
150.000	152.000	3	Alcatel-Lucent RRH2x40W-07L
150.000	152.000	3	CSS XDUO6-80-R
150.000	152.000	3	CSS XDUO6-80-R
150.000	152.000	3	Alcatel-Lucent RRH4X25-WCS
150.000	152.000	3	AlcatelLucent RRH2X60-1900A-
150.000	152.000	1	Powerwave P65-16-XLH-RR
150.000	152.000	1	Powerwave Allgon P65-16-
150.000	152.000	1	Raycap DC6-48-60-18-8F(32.8 lb
150.000	152.000	3	Powerwave TT08-19DB111-001
150.000	152.000	6	Andrew ETD819G-12UB
150.000	150.000	1	Flat Platform with Handrails
136.000	136.000	1	Round Low Profile Platform
136.000	136.000	6	Andrew LNX-6515DS-A1M
136.000	136.000	3	Kathrein 800 10510V01
136.000	136.000	3	Ericsson AIR 32 (57" Height)
136.000	136.000	3	Ericsson RRUS B13 w/ RRUS A2
136.000	136.000	2	RFS DB-B1-6C-12AB-0Z
136.000	136.000	3	Commscope TMA-T-DB78-DD-
136.000	136.000	3	Commscope CBC78-DF-2X
132.000	132.000	3	Nokia FHFB
132.000	132.000	1	Round Platform w/ Handrails
132.000	132.000	6	Andrew TMBXX-6517-A2M w/
132.000	132.000	3	Andrew TMBX-6517-R2M w/
132.000	132.000	1	Raycap ASU9338TYP01
132.000	132.000	3	Nokia FRIG w/o Solar Shield
132.000	132.000	3	Andrew ETW200VS12UB
122.000	122.000	1	Flat Platform with Handrails
122.000	122.000	9	48" x 12" Panel
115.000	115.000	1	Andrew VHLP2.5
115.000	115.000	3	Round Side Arm
115.000	115.000	1	Andrew VHLP2.5
115.000	115.000	3	Argus LLPX310R
115.000	115.000	3	Samsung 2.5GHz nRRHv2
115.000	115.000	2	DragonWave Horizon DUO

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
5.000	115.0	1/2" Coax	Yes
5.000	115.0	1/2" Coax	Yes



5.000	115.0	2" Conduit	Yes
5.000	115.0	5/16" (0.31"-	Yes
5.000	122.0	1 5/8" Coax	No
5.000	132.0	1 5/8" Coax	Yes
5.000	132.0	1 5/8" (1.63"-	Yes
5.000	132.0	7/8" Coax	Yes
5.000	136.0	1 1/4" Hybriflex	No
5.000	136.0	1 5/8" Coax	No
5.000	150.0	0.39" (10mm)	No
5.000	150.0	0.78" (19.7mm) 8	No
5.000	150.0	0.78" (19.7mm) 8	No
5.000	150.0	1 5/8" Coax	No
5.000	150.0	1 5/8" Coax	No
5.000	150.0	2" Conduit	No
0.000	150.0	3/8" (0.38"-	No

Load Cases

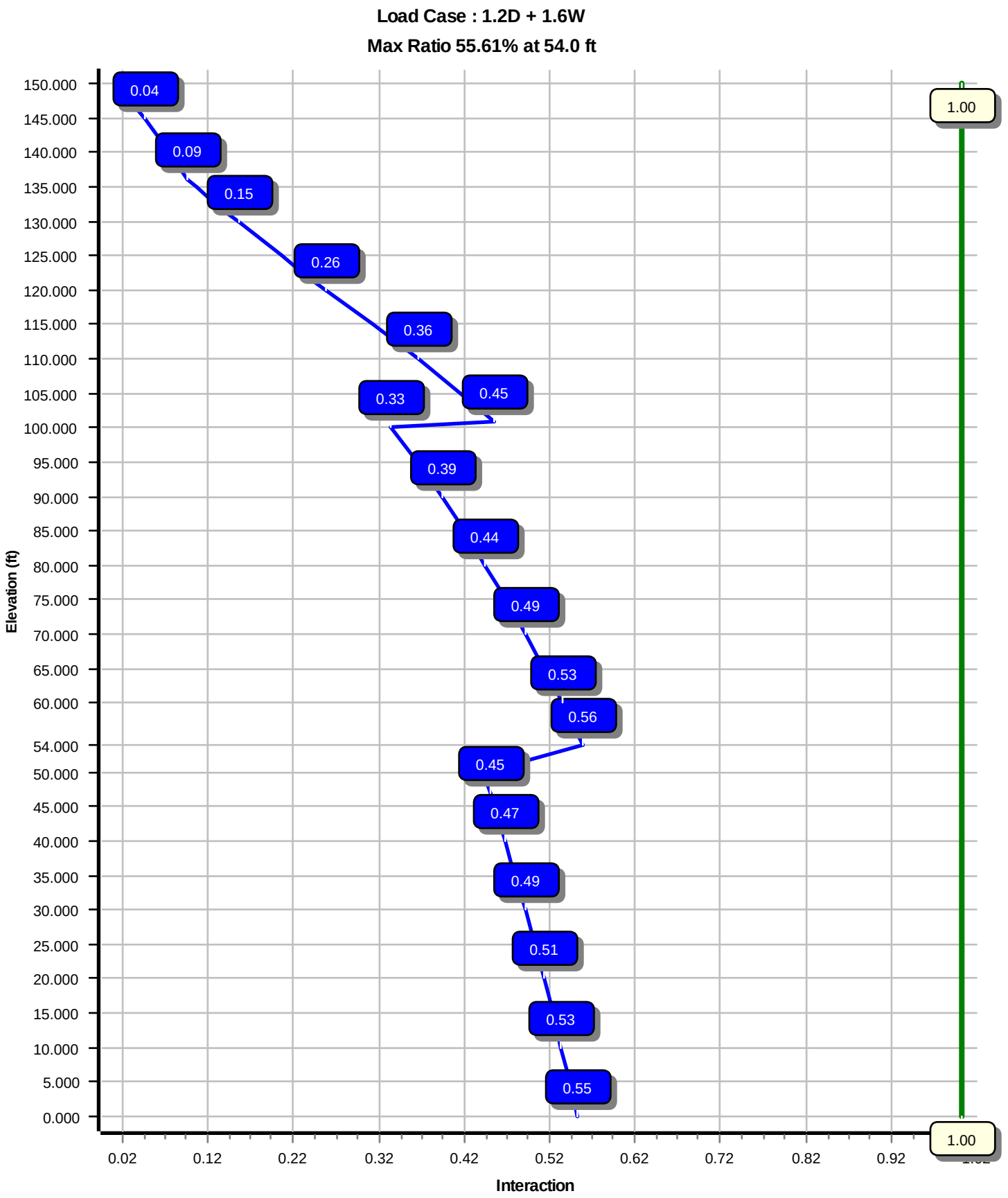
1.2D + 1.6W	90 mph with No Ice
0.9D + 1.6W	90 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	4153.33	40.06	60.45
0.9D + 1.6W	3995.91	38.58	45.33
1.2D + 1.0Di + 1.0Wi	745.69	6.72	109.17
(1.2 + 0.2Sds) * DL + E ELFM	217.89	1.82	59.72
(1.2 + 0.2Sds) * DL + E EMAM	226.34	1.85	59.72
(0.9 - 0.2Sds) * DL + E ELFM	215.92	1.82	42.73
(0.9 - 0.2Sds) * DL + E EMAM	224.18	1.85	42.73
1.0D + 1.0W	1113.51	10.72	50.41

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	115.00	10.694	0.917
1.0D + 1.0W	115.00	10.694	0.917


Load Case : 1.2D + 1.6W
Max Ratio 55.61% at 54.0 ft
Elevation (ft)
150.000
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
54.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
0.04
0.09
0.15
0.26
0.36
0.33
0.45
0.39
0.44
0.49
0.53
0.56
0.45
0.47
0.49
0.51
0.53
0.55
1.00
1.00
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number:	**306042**	**Code: ANSI/TIA-222-G**	
Site Name:	**Woods Chapel, MO**	**Engineering Number:OAA720732_C3_01**	**1/11/2018 11:11:32 AM**
Customer:	**AT&T MOBILITY**		

Analysis Parameters

Location :	**JACKSON County, MO**	**Height (ft) :**	**150**
Code :	**ANSI/TIA-222-G**	**Base Diameter (in) :**	**60.50**
Shape :	**12 Sides**	**Top Diameter (in) :**	**24.74**
Pole Type :	**Taper**	**Taper (in/ft) :**	**0.248**
Pole Manfacturer :	**Valmont**	**Rotation (deg) :**	**0.00**

Ice & Wind Parameters

Structure Class:	**II**	**Design Wind Speed Without Ice:**	**90 mph**
Exposure Category:	**C**	**Design Wind Speed With Ice:**	**40 mph**
Topographic Category:	**1**	**Operational Wind Speed:**	**60 mph**
Crest Height:	**0 ft**	**Design Ice Thickness:**	**1.00 in**

Seismic Parameters

Analysis Method:	**Equivalent Modal Analysis & Equivalent Lateral Force Methods**				
Site Class:	**D - Stiff Soil**				
Period Based on Rayleigh Method (sec):	**1.98**				
T_L (sec):	**12**	**p:**	**1**	**C_s:**	**0.036**
S_s:	**0.113**	**S_1:**	**0.067**	**C_s Max:**	**0.036**
F_a:	**1.600**	**F_v:**	**2.400**	**C_s Min:**	**0.030**
S_{ds}:	**0.121**	**S_{d1}:**	**0.107**		

Load Cases

1.2D + 1.6W	**90 mph with No Ice**
0.9D + 1.6W	**90 mph with No Ice (Reduced DL)**
1.2D + 1.0Di + 1.0Wi	**40 mph with 1.00 in Radial Ice**
(1.2 + 0.2Sds) * DL + E ELFM	**Seismic Equivalent Lateral Forces Method**
(1.2 + 0.2Sds) * DL + E EMAM	**Seismic Equivalent Modal Analysis Method**
(0.9 - 0.2Sds) * DL + E ELFM	**Seismic (Reduced DL) Equivalent Lateral Forces Method**
(0.9 - 0.2Sds) * DL + E EMAM	**Seismic (Reduced DL) Equivalent Modal Analysis Method**
1.0D + 1.0W	**Serviceability 60 mph**

Site Number: 306042 **Code:** ANSI/TIA-222-G

Site Name: Woods Chapel, MO **Engineering Number:**OAA720732_C3_01 **1/11/2018 11:11:32 AM**

Customer: AT&T MOBILITY

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	54.000	0.5000	65		0.00	15,769	60.50	0.00	96.60	44388.0	29.74	121.00	47.10	54.00	75.04	20807.6	22.57	94.22	0.247981
2-12	53.917	0.4060	65	Slip	83.00	10,204	49.63	47.08	64.36	19909.7	30.08	122.26	36.26	101.00	46.88	7694.8	21.26	89.33	0.247981
3-12	54.500	0.3125	65	Slip	66.00	5,819	38.25	95.50	38.18	7015.6	30.12	122.42	24.74	150.00	24.58	1872.1	18.53	79.17	0.247981
				Shaft Weight		31,793													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Distance From Face (ft)	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor
150.00	Alcatel-Lucent RRH2x40W-07L (7	3	0.000	2.000	51.00	2.140	0.50
150.00	Alcatel-Lucent RRH4X25-WCS	3	0.000	2.000	70.00	3.160	0.50
150.00	AlcatelLucent RRH2X60-1900A-	3	0.000	2.000	46.00	1.870	0.50
150.00	Andrew ETD819G-12UB	6	0.000	2.000	33.00	1.840	0.50
150.00	Commscope JAH4-65C-R4	3	0.000	2.000	87.30	12.860	0.69
150.00	CSS XDUO6-80-R	3	0.000	2.000	46.00	8.750	0.68
150.00	CSS XDUO6-80-R	3	0.000	2.000	46.00	8.750	0.68
150.00	Flat Platform with Handrails	1	0.000	0.000	2000.00	42.400	1.00
150.00	Powerwave Allgon P65-16-XLH-	1	0.000	2.000	53.00	8.130	0.67
150.00	Powerwave Allgon P65-17-XLH-	2	0.000	2.000	59.00	11.470	0.67
150.00	Powerwave P65-16-XLH-RR	1	0.000	2.000	53.00	8.130	0.67
150.00	Powerwave TT08-19DB111-001	3	0.000	2.000	22.00	0.920	0.50
150.00	Raycap DC6-48-60-0-8C	1	0.000	2.000	16.00	1.140	0.67
150.00	Raycap DC6-48-60-18-8F(32.8 lb	1	0.000	2.000	32.80	1.280	1.00
136.00	Andrew LNX-6515DS-A1M	6	0.000	0.000	49.80	11.410	0.70
136.00	Commscope CBC78-DF-2X	3	0.000	0.000	13.20	0.450	0.50
136.00	Commscope TMA-T-DB78-DD-A	3	0.000	0.000	38.50	1.480	0.50
136.00	Ericsson AIR 32 (57" Height)	3	0.000	0.000	99.00	6.180	0.71
136.00	Ericsson RRUS B13 w/ RRUS A2	3	0.000	0.000	72.00	2.790	0.50
136.00	Kathrein 800 10510V01	3	0.000	0.000	37.50	6.180	0.59
136.00	RFS DB-B1-6C-12AB-0Z	2	0.000	0.000	21.40	2.510	0.50
136.00	Round Low Profile Platform	1	0.000	0.000	1500.00	21.700	1.00
132.00	Andrew ETW200VS12UB	3	0.000	0.000	11.00	0.760	0.50
132.00	Andrew TMBX-6517-R2M w/ Act.	3	0.000	0.000	19.80	6.010	0.69
132.00	Andrew TMBXX-6517-A2M w/	6	0.000	0.000	34.60	6.500	0.68
132.00	Nokia FHFB	3	0.000	0.000	48.50	2.420	0.50
132.00	Nokia FRIG w/o Solar Shield	3	0.000	0.000	54.00	2.290	0.50
132.00	Raycap ASU9338TYP01	1	0.000	0.000	14.90	3.210	0.67
132.00	Round Platform w/ Handrails	1	0.000	0.000	2000.00	27.200	1.00
122.00	48" x 12" Panel	9	0.000	0.000	30.00	5.070	0.66
122.00	Flat Platform with Handrails	1	0.000	0.000	2000.00	42.400	1.00
115.00	Andrew VHLP2.5	1	0.000	0.000	47.60	8.430	0.97
115.00	Andrew VHLP2.5	1	0.000	0.000	47.60	8.430	0.58
115.00	Argus LLPX310R	3	0.000	0.000	28.60	4.290	0.63
115.00	DragonWave Horizon DUO	2	0.000	0.000	7.00	0.200	0.50
115.00	Round Side Arm	3	0.000	0.000	150.00	5.200	1.00
115.00	Samsung 2.5GHz nRRHv2	3	0.000	0.000	50.70	2.500	0.50
Totals	Num Loadings:37	101			11887.40		

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	150.00	1	3/8" (0.38"- 9.5mm)	0.38	0.23	N	0.00	N	AT&T Mobility
5.00	150.00	1	0.39" (10mm) Fiber	0.39	0.07	N	0.00	N	AT&T Mobility

5.00	150.00	2	0.78" (19.7mm) 8	0.78	0.59	N	0.00	N	AT&T Mobility
5.00	150.00	2	0.78" (19.7mm) 8	0.78	0.59	N	0.00	N	AT&T Mobility
5.00	150.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
5.00	150.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
5.00	150.00	1	2" Conduit	2.38	3.65	N	0.00	N	AT&T Mobility
5.00	136.00	2	1 1/4" Hybriflex	1.54	1.00	N	0.00	N	Verizon
5.00	136.00	13	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
5.00	132.00	6	1 5/8" Coax	1.98	0.82	N	1.98	Y	T-Mobile
5.00	132.00	1	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	1.63	Y	T-Mobile
5.00	132.00	6	7/8" Coax	1.09	0.33	N	0.00	Y	T-Mobile
5.00	122.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Sprint Nextel
5.00	115.00	2	1/2" Coax	0.63	0.15	N	0.00	Y	Clearwire
5.00	115.00	3	1/2" Coax	0.63	0.15	N	0.00	Y	Clearwire
5.00	115.00	1	2" Conduit	2.38	3.65	N	2.38	Y	Clearwire
5.00	115.00	3	5/16" (0.31"-7.9mm)	0.31	0.05	N	0.00	Y	Clearwire

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.5000	60.500	96.600	44,388.0	29.74	121.00	72.3	1417.	0.0	0.0
5.00		0.5000	59.260	94.604	41,692.6	29.08	118.52	73.0	1359.	0.0	1,626.6
10.00		0.5000	58.020	92.608	39,108.6	28.41	116.04	73.7	1302.	0.0	1,592.6
15.00		0.5000	56.780	90.611	36,633.7	27.75	113.56	74.5	1246.	0.0	1,558.6
20.00		0.5000	55.540	88.615	34,265.4	27.08	111.08	75.2	1191.	0.0	1,524.7
25.00		0.5000	54.300	86.619	32,001.5	26.42	108.60	75.9	1138.	0.0	1,490.7
30.00		0.5000	53.061	84.623	29,839.5	25.76	106.12	76.6	1086.	0.0	1,456.7
35.00		0.5000	51.821	82.626	27,777.2	25.09	103.64	77.3	1035.	0.0	1,422.8
40.00		0.5000	50.581	80.630	25,812.2	24.43	101.16	78.1	985.9	0.0	1,388.8
45.00		0.5000	49.341	78.634	23,942.1	23.76	98.68	78.8	937.4	0.0	1,354.8
47.08	Bot - Section 2	0.5000	48.824	77.802	23,190.3	23.49	97.65	79.1	917.6	0.0	554.5
50.00		0.5000	48.101	76.638	22,164.6	23.10	96.20	79.5	890.2	0.0	1,400.5
54.00	Top - Section 1	0.4060	47.921	62.117	17,900.3	28.95	118.03	73.1	721.6	0.0	1,886.6
55.00		0.4060	47.673	61.793	17,621.5	28.78	117.42	73.3	714.1	0.0	210.8
60.00		0.4060	46.433	60.172	16,270.8	27.97	114.37	74.2	676.9	0.0	1,037.6
65.00		0.4060	45.193	58.551	14,991.0	27.15	111.31	75.1	640.8	0.0	1,010.0
70.00		0.4060	43.953	56.930	13,780.1	26.33	108.26	76.0	605.7	0.0	982.4
75.00		0.4060	42.713	55.309	12,636.2	25.51	105.21	76.9	571.5	0.0	954.8
80.00		0.4060	41.474	53.688	11,557.5	24.69	102.15	77.8	538.4	0.0	927.2
85.00		0.4060	40.234	52.067	10,542.0	23.87	99.10	78.7	506.2	0.0	899.7
90.00		0.4060	38.994	50.447	9,587.7	23.06	96.04	79.6	475.0	0.0	872.1
95.00		0.4060	37.754	48.826	8,692.9	22.24	92.99	80.5	444.8	0.0	844.5
95.50	Bot - Section 3	0.4060	37.630	48.663	8,606.6	22.16	92.68	80.6	441.8	0.0	82.9
100.0		0.4060	36.514	47.205	7,855.5	21.42	89.94	81.4	415.6	0.0	1,310.0
101.0	Top - Section 2	0.3125	36.891	36.807	6,285.9	28.95	118.05	73.1	329.2	0.0	285.7
105.0		0.3125	35.899	35.809	5,788.3	28.10	114.88	74.1	311.5	0.0	494.2
110.0		0.3125	34.659	34.561	5,204.1	27.04	110.91	75.2	290.1	0.0	598.6
115.0		0.3125	33.419	33.314	4,660.6	25.98	106.94	76.4	269.4	0.0	577.4
120.0		0.3125	32.179	32.066	4,156.3	24.91	102.97	77.5	249.5	0.0	556.2
122.0		0.3125	31.683	31.567	3,965.2	24.49	101.39	78.0	241.8	0.0	216.5
125.0		0.3125	30.939	30.818	3,689.8	23.85	99.01	78.7	230.4	0.0	318.4
130.0		0.3125	29.700	29.571	3,259.6	22.79	95.04	79.9	212.0	0.0	513.7
132.0		0.3125	29.204	29.072	3,097.3	22.36	93.45	80.3	204.9	0.0	199.5
135.0		0.3125	28.460	28.323	2,864.1	21.72	91.07	81.0	194.4	0.0	293.0
136.0		0.3125	28.212	28.073	2,789.1	21.51	90.28	81.3	191.0	0.0	96.0
140.0		0.3125	27.220	27.075	2,502.1	20.66	87.10	81.9	177.6	0.0	375.3
145.0		0.3125	25.980	25.828	2,171.9	19.60	83.14	81.9	161.5	0.0	450.0
150.0		0.3125	24.740	24.580	1,872.1	18.53	79.17	81.9	146.2	0.0	428.8
											31,793.3

Load Case: 1.2D + 1.6W — 90 mph with No Ice — 21 Iterations

Gust Response Factor :1.10 — Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		380.6	0.0					0.0	0.0	380.6	0.0	0.0	0.0
5.00		753.3	1,951.9					0.0	1.4	753.3	1,953.3	0.0	0.0
10.00		738.4	1,911.1					0.0	310.1	738.4	2,221.3	0.0	0.0
15.00		737.3	1,870.4					0.0	310.1	737.3	2,180.5	0.0	0.0
20.00		757.4	1,829.6					0.0	310.1	757.4	2,139.7	0.0	0.0
25.00		782.0	1,788.8					0.0	310.1	782.0	2,099.0	0.0	0.0
30.00		800.0	1,748.1					0.0	310.1	800.0	2,058.2	0.0	0.0
35.00		813.4	1,707.3					0.0	310.1	813.4	2,017.5	0.0	0.0
40.00		823.2	1,666.6					0.0	310.1	823.2	1,976.7	0.0	0.0
45.00		586.8	1,625.8					0.0	310.1	586.8	1,936.0	0.0	0.0
47.08	Bot - Section 2	420.4	665.4					0.0	129.2	420.4	794.6	0.0	0.0
50.00		587.3	1,680.5					0.0	180.9	587.3	1,861.5	0.0	0.0
54.00	Top - Section 1	424.7	2,263.9					0.0	248.1	424.7	2,512.0	0.0	0.0
55.00		508.3	253.0					0.0	62.0	508.3	315.0	0.0	0.0
60.00		847.4	1,245.1					0.0	310.1	847.4	1,555.2	0.0	0.0
65.00		846.8	1,212.0					0.0	310.1	846.8	1,522.1	0.0	0.0
70.00		844.9	1,178.9					0.0	310.1	844.9	1,489.0	0.0	0.0
75.00		841.8	1,145.8					0.0	310.1	841.8	1,455.9	0.0	0.0
80.00		837.6	1,112.7					0.0	310.1	837.6	1,422.8	0.0	0.0
85.00		832.5	1,079.6					0.0	310.1	832.5	1,389.7	0.0	0.0
90.00		826.6	1,046.5					0.0	310.1	826.6	1,356.6	0.0	0.0
95.00		452.7	1,013.4					0.0	310.1	452.7	1,323.5	0.0	0.0
95.50	Bot - Section 3	414.3	99.5					0.0	31.0	414.3	130.5	0.0	0.0
100.00		455.9	1,572.0					0.0	279.1	455.9	1,851.2	0.0	0.0
101.00	Top - Section 2	408.9	342.9					0.0	62.0	408.9	404.9	0.0	0.0
105.00		730.4	593.0					0.0	248.1	730.4	841.2	0.0	0.0
110.00		803.7	718.4					0.0	310.1	803.7	1,028.5	0.0	0.0
115.00	Appurtenance(s)	726.8	692.9	1,613.3	0.0	0.0	956.5	0.0	310.1	2,340.1	1,959.6	0.0	0.0
120.00		456.5	667.4					0.0	282.9	456.5	950.4	0.0	0.0
122.00	Appurtenance(s)	321.5	259.8	2,973.5	0.0	0.0	2,724.0	0.0	113.2	3,295.0	3,097.0	0.0	0.0
125.00		507.8	382.1					0.0	134.3	507.8	516.5	0.0	0.0
130.00		440.1	616.5					0.0	223.9	440.1	840.4	0.0	0.0
132.00	Appurtenance(s)	298.5	239.5	2,986.0	0.0	0.0	3,146.9	0.0	89.6	3,284.6	3,475.9	0.0	0.0
135.00		231.2	351.5					0.0	103.7	231.2	455.2	0.0	0.0
136.00	Appurtenance(s)	281.7	115.1	4,072.4	0.0	0.0	3,146.6	0.0	34.6	4,354.2	3,296.4	0.0	0.0
140.00		495.8	450.4					0.0	77.5	495.8	527.9	0.0	0.0
145.00		531.7	540.1					0.0	96.9	531.7	636.9	0.0	0.0
150.00	Appurtenance(s)	260.5	514.6	5,918.2	0.0	7,783.9	4,290.8	0.0	96.9	6,178.7	4,902.3	0.0	0.0
								Totals:		40,372.2	60,494.8	0.00	0.00

Load Case: 1.2D + 1.6W — 90 mph with No Ice — 21 Iterations

Gust Response Factor :1.10 — Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-60.45	-40.06	0.00	-4,153.33	0.00	4,153.33	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.550
5.00	-58.41	-39.44	0.00	-3,953.02	0.00	3,953.02	6,215.54	3,107.77	15,067.9	7,441.50	0.07	-0.13	0.541
10.00	-56.10	-38.82	0.00	-3,755.83	0.00	3,755.83	6,144.79	3,072.40	14,579.4	7,200.24	0.28	-0.26	0.531
15.00	-53.83	-38.20	0.00	-3,561.72	0.00	3,561.72	6,071.43	3,035.72	14,092.2	6,959.61	0.62	-0.39	0.521
20.00	-51.61	-37.55	0.00	-3,370.73	0.00	3,370.73	5,995.47	2,997.74	13,606.6	6,719.79	1.11	-0.53	0.510
25.00	-49.43	-36.86	0.00	-3,183.00	0.00	3,183.00	5,916.91	2,958.45	13,123.0	6,481.00	1.74	-0.67	0.500
30.00	-47.30	-36.15	0.00	-2,998.70	0.00	2,998.70	5,835.74	2,917.87	12,642.0	6,243.42	2.51	-0.80	0.489
35.00	-45.21	-35.41	0.00	-2,817.96	0.00	2,817.96	5,751.96	2,875.98	12,163.8	6,007.26	3.42	-0.94	0.477
40.00	-43.16	-34.66	0.00	-2,640.89	0.00	2,640.89	5,665.59	2,832.79	11,688.9	5,772.71	4.48	-1.08	0.465
45.00	-41.18	-34.11	0.00	-2,467.58	0.00	2,467.58	5,576.60	2,788.30	11,217.6	5,539.98	5.69	-1.22	0.453
47.08	-40.35	-33.72	0.00	-2,396.53	0.00	2,396.53	5,538.76	2,769.38	11,022.4	5,443.59	6.24	-1.28	0.448
50.00	-38.44	-33.16	0.00	-2,298.17	0.00	2,298.17	5,485.02	2,742.51	10,750.4	5,309.26	7.05	-1.37	0.440
54.00	-35.90	-32.72	0.00	-2,165.54	0.00	2,165.54	4,089.14	2,044.57	8,015.67	3,958.64	8.24	-1.48	0.556
55.00	-35.55	-32.26	0.00	-2,132.83	0.00	2,132.83	4,077.72	2,038.86	7,951.23	3,926.81	8.56	-1.51	0.552
60.00	-33.92	-31.47	0.00	-1,971.53	0.00	1,971.53	4,019.09	2,009.54	7,629.57	3,767.96	10.23	-1.68	0.532
65.00	-32.34	-30.67	0.00	-1,814.19	0.00	1,814.19	3,957.85	1,978.93	7,309.15	3,609.72	12.07	-1.84	0.511
70.00	-30.79	-29.86	0.00	-1,660.85	0.00	1,660.85	3,894.01	1,947.00	6,990.38	3,452.29	14.09	-2.01	0.489
75.00	-29.29	-29.05	0.00	-1,511.53	0.00	1,511.53	3,827.56	1,913.78	6,673.66	3,295.87	16.28	-2.17	0.466
80.00	-27.82	-28.24	0.00	-1,366.28	0.00	1,366.28	3,758.51	1,879.26	6,359.38	3,140.66	18.64	-2.33	0.443
85.00	-26.39	-27.42	0.00	-1,225.09	0.00	1,225.09	3,686.86	1,843.43	6,047.96	2,986.86	21.17	-2.49	0.418
90.00	-25.00	-26.60	0.00	-1,088.00	0.00	1,088.00	3,612.60	1,806.30	5,739.79	2,834.67	23.86	-2.65	0.391
95.00	-23.66	-26.12	0.00	-955.00	0.00	955.00	3,535.74	1,767.87	5,435.29	2,684.28	26.71	-2.80	0.363
95.50	-23.52	-25.73	0.00	-941.94	0.00	941.94	3,527.91	1,763.96	5,405.06	2,669.36	27.01	-2.81	0.360
100.00	-21.66	-25.21	0.00	-826.16	0.00	826.16	3,456.27	1,728.14	5,134.84	2,535.91	29.72	-2.95	0.332
101.00	-21.24	-24.81	0.00	-800.95	0.00	800.95	2,422.80	1,211.40	3,656.12	1,805.62	30.34	-2.98	0.453
105.00	-20.39	-24.08	0.00	-701.71	0.00	701.71	2,386.99	1,193.50	3,503.58	1,730.29	32.89	-3.09	0.414
110.00	-19.34	-23.27	0.00	-581.30	0.00	581.30	2,339.89	1,169.95	3,313.74	1,636.53	36.20	-3.24	0.364
115.00	-17.47	-20.87	0.00	-464.93	0.00	464.93	2,290.19	1,145.09	3,125.21	1,543.42	39.68	-3.39	0.309
120.00	-16.52	-20.38	0.00	-360.60	0.00	360.60	2,237.88	1,118.94	2,938.39	1,451.16	43.30	-3.51	0.256
122.00	-13.62	-16.91	0.00	-319.84	0.00	319.84	2,216.23	1,108.11	2,864.23	1,414.54	44.78	-3.56	0.232
125.00	-13.11	-16.39	0.00	-269.11	0.00	269.11	2,182.97	1,091.48	2,753.68	1,359.94	47.03	-3.62	0.204
130.00	-12.29	-15.91	0.00	-187.17	0.00	187.17	2,125.45	1,062.72	2,571.49	1,269.96	50.88	-3.71	0.153
132.00	-9.02	-12.41	0.00	-155.35	0.00	155.35	2,101.71	1,050.86	2,499.41	1,234.36	52.44	-3.74	0.130
135.00	-8.58	-12.15	0.00	-118.12	0.00	118.12	2,065.33	1,032.66	2,392.21	1,181.42	54.80	-3.78	0.104
136.00	-5.57	-7.59	0.00	-105.97	0.00	105.97	2,052.99	1,026.50	2,356.75	1,163.91	55.59	-3.79	0.094
140.00	-5.08	-7.07	0.00	-75.59	0.00	75.59	1,995.72	997.86	2,208.65	1,090.77	58.78	-3.83	0.072
145.00	-4.47	-6.50	0.00	-40.26	0.00	40.26	1,903.76	951.88	2,008.67	992.01	62.80	-3.86	0.043
150.00	0.00	-6.18	0.00	-7.78	0.00	7.78	1,811.80	905.90	1,818.18	897.93	66.85	-3.88	0.009

Load Case: 0.9D + 1.6W — 90 mph with No Ice (Reduced DL) — 21 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		380.6	0.0					0.0	0.0	380.6	0.0	0.0	0.0
5.00		753.3	1,463.9					0.0	1.0	753.3	1,464.9	0.0	0.0
10.00		737.6	1,433.3					0.0	232.6	737.6	1,665.9	0.0	0.0
15.00		733.1	1,402.8					0.0	232.6	733.1	1,635.4	0.0	0.0
20.00		747.9	1,372.2					0.0	232.6	747.9	1,604.8	0.0	0.0
25.00		766.8	1,341.6					0.0	232.6	766.8	1,574.2	0.0	0.0
30.00		778.9	1,311.1					0.0	232.6	778.9	1,543.7	0.0	0.0
35.00		785.9	1,280.5					0.0	232.6	785.9	1,513.1	0.0	0.0
40.00		789.1	1,249.9					0.0	232.6	789.1	1,482.5	0.0	0.0
45.00		559.3	1,219.4					0.0	232.6	559.3	1,452.0	0.0	0.0
47.08	Bot - Section 2	398.0	499.0					0.0	96.9	398.0	596.0	0.0	0.0
50.00		553.1	1,260.4					0.0	135.7	553.1	1,396.1	0.0	0.0
54.00	Top - Section 1	399.1	1,697.9					0.0	186.1	399.1	1,884.0	0.0	0.0
55.00		476.0	189.7					0.0	46.5	476.0	236.3	0.0	0.0
60.00		789.1	933.8					0.0	232.6	789.1	1,166.4	0.0	0.0
65.00		781.1	909.0					0.0	232.6	781.1	1,141.6	0.0	0.0
70.00		771.6	884.2					0.0	232.6	771.6	1,116.8	0.0	0.0
75.00		760.8	859.3					0.0	232.6	760.8	1,091.9	0.0	0.0
80.00		748.9	834.5					0.0	232.6	748.9	1,067.1	0.0	0.0
85.00		735.8	809.7					0.0	232.6	735.8	1,042.3	0.0	0.0
90.00		721.8	784.9					0.0	232.6	721.8	1,017.5	0.0	0.0
95.00		392.6	760.1					0.0	232.6	392.6	992.7	0.0	0.0
95.50	Bot - Section 3	354.9	74.6					0.0	23.3	354.9	97.9	0.0	0.0
100.00		389.7	1,179.0					0.0	209.4	389.7	1,388.4	0.0	0.0
101.00	Top - Section 2	347.4	257.2					0.0	46.5	347.4	303.7	0.0	0.0
105.00		616.3	444.8					0.0	186.1	616.3	630.9	0.0	0.0
110.00		669.2	538.8					0.0	232.6	669.2	771.4	0.0	0.0
115.00	Appurtenance(s)	651.4	519.7	1,613.3	0.0	0.0	717.4	0.0	232.6	2,264.6	1,469.7	0.0	0.0
120.00		447.0	500.6					0.0	212.2	447.0	712.8	0.0	0.0
122.00	Appurtenance(s)	311.7	194.9	2,973.5	0.0	0.0	2,043.0	0.0	84.9	3,285.2	2,322.8	0.0	0.0
125.00		487.9	286.6					0.0	100.8	487.9	387.3	0.0	0.0
130.00		420.0	462.4					0.0	167.9	420.0	630.3	0.0	0.0
132.00	Appurtenance(s)	292.0	179.6	2,986.0	0.0	0.0	2,360.2	0.0	67.2	3,278.0	2,606.9	0.0	0.0
135.00		231.2	263.7					0.0	77.8	231.2	341.4	0.0	0.0
136.00	Appurtenance(s)	281.7	86.4	4,072.4	0.0	0.0	2,360.0	0.0	25.9	4,354.2	2,472.3	0.0	0.0
140.00		495.8	337.8					0.0	58.1	495.8	395.9	0.0	0.0
145.00		531.7	405.0					0.0	72.7	531.7	477.7	0.0	0.0
150.00	Appurtenance(s)	260.5	385.9	5,918.2	0.0	7,783.9	3,218.1	0.0	72.7	6,178.7	3,676.7	0.0	0.0
								Totals:		38,912.0	45,371.1	0.00	0.00

Load Case: 0.9D + 1.6W — 90 mph with No Ice (Reduced DL) — 21 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-45.33	-38.58	0.00	-3,995.91	0.00	3,995.91	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.527
5.00	-43.78	-37.92	0.00	-3,803.01	0.00	3,803.01	6,215.54	3,107.77	15,067.9	7,441.50	0.07	-0.12	0.518
10.00	-42.03	-37.27	0.00	-3,613.39	0.00	3,613.39	6,144.79	3,072.40	14,579.4	7,200.24	0.27	-0.25	0.509
15.00	-40.32	-36.62	0.00	-3,427.03	0.00	3,427.03	6,071.43	3,035.72	14,092.2	6,959.61	0.60	-0.38	0.499
20.00	-38.64	-35.95	0.00	-3,243.92	0.00	3,243.92	5,995.47	2,997.74	13,606.6	6,719.79	1.07	-0.51	0.489
25.00	-36.99	-35.25	0.00	-3,064.18	0.00	3,064.18	5,916.91	2,958.45	13,123.0	6,481.00	1.67	-0.64	0.479
30.00	-35.38	-34.54	0.00	-2,887.92	0.00	2,887.92	5,835.74	2,917.87	12,642.0	6,243.42	2.41	-0.77	0.469
35.00	-33.80	-33.81	0.00	-2,715.24	0.00	2,715.24	5,751.96	2,875.98	12,163.8	6,007.26	3.29	-0.91	0.458
40.00	-32.25	-33.07	0.00	-2,546.20	0.00	2,546.20	5,665.59	2,832.79	11,688.9	5,772.71	4.32	-1.04	0.447
45.00	-30.76	-32.53	0.00	-2,380.86	0.00	2,380.86	5,576.60	2,788.30	11,217.6	5,539.98	5.48	-1.18	0.435
47.08	-30.13	-32.16	0.00	-2,313.08	0.00	2,313.08	5,538.76	2,769.38	11,022.4	5,443.59	6.01	-1.23	0.430
50.00	-28.69	-31.62	0.00	-2,219.28	0.00	2,219.28	5,485.02	2,742.51	10,750.4	5,309.26	6.79	-1.32	0.423
54.00	-26.78	-31.21	0.00	-2,092.78	0.00	2,092.78	4,089.14	2,044.57	8,015.67	3,958.64	7.94	-1.43	0.535
55.00	-26.51	-30.78	0.00	-2,061.57	0.00	2,061.57	4,077.72	2,038.86	7,951.23	3,926.81	8.24	-1.45	0.532
60.00	-25.28	-30.03	0.00	-1,907.70	0.00	1,907.70	4,019.09	2,009.54	7,629.57	3,767.96	9.85	-1.61	0.513
65.00	-24.08	-29.28	0.00	-1,757.57	0.00	1,757.57	3,957.85	1,978.93	7,309.15	3,609.72	11.63	-1.78	0.493
70.00	-22.91	-28.54	0.00	-1,611.18	0.00	1,611.18	3,894.01	1,947.00	6,990.38	3,452.29	13.57	-1.93	0.473
75.00	-21.77	-27.80	0.00	-1,468.50	0.00	1,468.50	3,827.56	1,913.78	6,673.66	3,295.87	15.68	-2.09	0.451
80.00	-20.65	-27.06	0.00	-1,329.52	0.00	1,329.52	3,758.51	1,879.26	6,359.38	3,140.66	17.96	-2.25	0.429
85.00	-19.57	-26.34	0.00	-1,194.20	0.00	1,194.20	3,686.86	1,843.43	6,047.96	2,986.86	20.40	-2.41	0.405
90.00	-18.52	-25.62	0.00	-1,062.50	0.00	1,062.50	3,612.60	1,806.30	5,739.79	2,834.67	23.01	-2.56	0.380
95.00	-17.51	-25.21	0.00	-934.39	0.00	934.39	3,535.74	1,767.87	5,435.29	2,684.28	25.77	-2.71	0.353
95.50	-17.40	-24.87	0.00	-921.79	0.00	921.79	3,527.91	1,763.96	5,405.06	2,669.36	26.05	-2.72	0.350
100.00	-16.00	-24.44	0.00	-809.86	0.00	809.86	3,456.27	1,728.14	5,134.84	2,535.91	28.68	-2.85	0.324
101.00	-15.68	-24.09	0.00	-785.42	0.00	785.42	2,422.80	1,211.40	3,656.12	1,805.62	29.28	-2.88	0.442
105.00	-15.03	-23.48	0.00	-689.04	0.00	689.04	2,386.99	1,193.50	3,503.58	1,730.29	31.74	-2.99	0.405
110.00	-14.24	-22.81	0.00	-571.64	0.00	571.64	2,339.89	1,169.95	3,313.74	1,636.53	34.95	-3.14	0.356
115.00	-12.85	-20.50	0.00	-457.59	0.00	457.59	2,290.19	1,145.09	3,125.21	1,543.42	38.32	-3.28	0.302
120.00	-12.13	-20.03	0.00	-355.11	0.00	355.11	2,237.88	1,118.94	2,938.39	1,451.16	41.83	-3.41	0.250
122.00	-10.00	-16.62	0.00	-315.06	0.00	315.06	2,216.23	1,108.11	2,864.23	1,414.54	43.27	-3.45	0.227
125.00	-9.62	-16.12	0.00	-265.22	0.00	265.22	2,182.97	1,091.48	2,753.68	1,359.94	45.46	-3.52	0.200
130.00	-9.00	-15.67	0.00	-184.62	0.00	184.62	2,125.45	1,062.72	2,571.49	1,269.96	49.19	-3.60	0.150
132.00	-6.60	-12.24	0.00	-153.29	0.00	153.29	2,101.71	1,050.86	2,499.41	1,234.36	50.71	-3.63	0.127
135.00	-6.27	-11.99	0.00	-116.58	0.00	116.58	2,065.33	1,032.66	2,392.21	1,181.42	53.00	-3.67	0.102
136.00	-4.08	-7.48	0.00	-104.59	0.00	104.59	2,052.99	1,026.50	2,356.75	1,163.91	53.77	-3.68	0.092
140.00	-3.71	-6.97	0.00	-74.65	0.00	74.65	1,995.72	997.86	2,208.65	1,090.77	56.87	-3.72	0.070
145.00	-3.26	-6.41	0.00	-39.82	0.00	39.82	1,903.76	951.88	2,008.67	992.01	60.78	-3.75	0.042
150.00	0.00	-6.18	0.00	-7.78	0.00	7.78	1,811.80	905.90	1,818.18	897.93	64.71	-3.77	0.009

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 20 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		59.2	0.0					0.0	0.0	59.2	0.0	0.0	0.0
5.00		117.6	2,560.4					0.0	1.4	117.6	2,561.7	0.0	0.0
10.00		115.7	2,578.3					0.0	632.4	115.7	3,210.8	0.0	0.0
15.00		115.4	2,559.0					0.0	655.4	115.4	3,214.4	0.0	0.0
20.00		118.1	2,527.4					0.0	671.6	118.1	3,199.1	0.0	0.0
25.00		121.5	2,489.5					0.0	684.3	121.5	3,173.9	0.0	0.0
30.00		123.7	2,447.7					0.0	694.9	123.7	3,142.5	0.0	0.0
35.00		125.2	2,403.1					0.0	703.9	125.2	3,106.9	0.0	0.0
40.00		126.0	2,356.4					0.0	711.8	126.0	3,068.2	0.0	0.0
45.00		89.5	2,308.2					0.0	718.9	89.5	3,027.1	0.0	0.0
47.08	Bot - Section 2	63.8	949.2					0.0	301.4	63.8	1,250.7	0.0	0.0
50.00		88.7	2,080.8					0.0	423.8	88.7	2,504.6	0.0	0.0
54.00	Top - Section 1	64.1	2,805.9					0.0	584.5	64.1	3,390.4	0.0	0.0
55.00		76.6	388.5					0.0	146.7	76.6	535.2	0.0	0.0
60.00		127.2	1,909.4					0.0	736.6	127.2	2,646.0	0.0	0.0
65.00		126.3	1,864.9					0.0	741.6	126.3	2,606.6	0.0	0.0
70.00		125.1	1,819.9					0.0	746.3	125.1	2,566.2	0.0	0.0
75.00		123.8	1,774.2					0.0	750.8	123.8	2,524.9	0.0	0.0
80.00		122.2	1,728.0					0.0	754.9	122.2	2,482.9	0.0	0.0
85.00		120.5	1,681.3					0.0	758.9	120.5	2,440.2	0.0	0.0
90.00		118.6	1,634.2					0.0	762.7	118.6	2,396.9	0.0	0.0
95.00		64.7	1,586.8					0.0	766.3	64.7	2,353.0	0.0	0.0
95.50	Bot - Section 3	58.6	156.8					0.0	76.8	58.6	233.6	0.0	0.0
100.00		64.4	2,083.1					0.0	692.9	64.4	2,776.0	0.0	0.0
101.00	Top - Section 2	57.6	456.0					0.0	154.3	57.6	610.4	0.0	0.0
105.00		102.4	1,035.4					0.0	618.7	102.4	1,654.1	0.0	0.0
110.00		111.6	1,255.7					0.0	776.1	111.6	2,031.9	0.0	0.0
115.00	Appurtenance(s)	109.1	1,214.7	294.8	0.0	0.0	2,347.0	0.0	779.2	404.0	4,340.9	0.0	0.0
120.00		75.1	1,173.4					0.0	568.4	75.1	1,741.8	0.0	0.0
122.00	Appurtenance(s)	52.6	459.9	555.0	0.0	0.0	5,802.9	0.0	227.8	607.6	6,490.6	0.0	0.0
125.00		82.7	676.3					0.0	306.7	82.7	983.0	0.0	0.0
130.00		71.4	1,090.0					0.0	512.4	71.4	1,602.4	0.0	0.0
132.00	Appurtenance(s)	49.9	426.5	645.1	0.0	0.0	6,905.1	0.0	205.4	695.0	7,536.9	0.0	0.0
135.00		39.5	626.0					0.0	103.7	39.5	729.7	0.0	0.0
136.00	Appurtenance(s)	48.4	206.0	755.1	0.0	0.0	7,976.7	0.0	34.6	803.5	8,217.3	0.0	0.0
140.00		85.6	802.8					0.0	77.5	85.6	880.3	0.0	0.0
145.00		92.4	963.5					0.0	96.9	92.4	1,060.4	0.0	0.0
150.00	Appurtenance(s)	45.4	920.9	1,026.3	0.0	1,222.2	11,861.1	0.0	96.9	1,071.7	12,878.9	0.0	0.0
								Totals:		6,756.50	109,170.	0.00	0.00

Load Case: 1.2D + 1.0Di + 1.0Wi — 40 mph with 1.00 in Radial Ice — 20 Iterations

Gust Response Factor :1.10 | Ice Dead Load Factor :1.00 | Wind Importance Factor :1.00
Dead Load Factor :1.20 | Ice Importance Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-109.17	-6.72	0.00	-745.69	0.00	745.69	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.114
5.00	-106.60	-6.65	0.00	-712.09	0.00	712.09	6,215.54	3,107.77	15,067.9	7,441.50	0.01	-0.02	0.113
10.00	-103.39	-6.57	0.00	-678.87	0.00	678.87	6,144.79	3,072.40	14,579.4	7,200.24	0.05	-0.05	0.111
15.00	-100.17	-6.49	0.00	-646.01	0.00	646.01	6,071.43	3,035.72	14,092.2	6,959.61	0.11	-0.07	0.109
20.00	-96.97	-6.41	0.00	-613.54	0.00	613.54	5,995.47	2,997.74	13,606.6	6,719.79	0.20	-0.10	0.107
25.00	-93.80	-6.33	0.00	-581.48	0.00	581.48	5,916.91	2,958.45	13,123.0	6,481.00	0.31	-0.12	0.106
30.00	-90.65	-6.24	0.00	-549.84	0.00	549.84	5,835.74	2,917.87	12,642.0	6,243.42	0.45	-0.15	0.104
35.00	-87.54	-6.14	0.00	-518.67	0.00	518.67	5,751.96	2,875.98	12,163.8	6,007.26	0.62	-0.17	0.102
40.00	-84.47	-6.04	0.00	-487.96	0.00	487.96	5,665.59	2,832.79	11,688.9	5,772.71	0.81	-0.20	0.099
45.00	-81.44	-5.97	0.00	-457.74	0.00	457.74	5,576.60	2,788.30	11,217.6	5,539.98	1.03	-0.22	0.097
47.08	-80.19	-5.92	0.00	-445.31	0.00	445.31	5,538.76	2,769.38	11,022.4	5,443.59	1.13	-0.23	0.096
50.00	-77.68	-5.85	0.00	-428.05	0.00	428.05	5,485.02	2,742.51	10,750.4	5,309.26	1.28	-0.25	0.095
54.00	-74.29	-5.78	0.00	-404.67	0.00	404.67	4,089.14	2,044.57	8,015.67	3,958.64	1.50	-0.27	0.120
55.00	-73.76	-5.73	0.00	-398.88	0.00	398.88	4,077.72	2,038.86	7,951.23	3,926.81	1.56	-0.28	0.120
60.00	-71.11	-5.63	0.00	-370.25	0.00	370.25	4,019.09	2,009.54	7,629.57	3,767.96	1.86	-0.31	0.116
65.00	-68.50	-5.52	0.00	-342.12	0.00	342.12	3,957.85	1,978.93	7,309.15	3,609.72	2.20	-0.34	0.112
70.00	-65.93	-5.42	0.00	-314.51	0.00	314.51	3,894.01	1,947.00	6,990.38	3,452.29	2.57	-0.37	0.108
75.00	-63.40	-5.31	0.00	-287.43	0.00	287.43	3,827.56	1,913.78	6,673.66	3,295.87	2.98	-0.40	0.104
80.00	-60.92	-5.20	0.00	-260.88	0.00	260.88	3,758.51	1,879.26	6,359.38	3,140.66	3.41	-0.43	0.099
85.00	-58.48	-5.09	0.00	-234.87	0.00	234.87	3,686.86	1,843.43	6,047.96	2,986.86	3.88	-0.46	0.095
90.00	-56.08	-4.98	0.00	-209.40	0.00	209.40	3,612.60	1,806.30	5,739.79	2,834.67	4.38	-0.49	0.089
95.00	-53.73	-4.91	0.00	-184.48	0.00	184.48	3,535.74	1,767.87	5,435.29	2,684.28	4.92	-0.52	0.084
95.50	-53.49	-4.87	0.00	-182.03	0.00	182.03	3,527.91	1,763.96	5,405.06	2,669.36	4.97	-0.52	0.083
100.00	-50.71	-4.79	0.00	-160.13	0.00	160.13	3,456.27	1,728.14	5,134.84	2,535.91	5.48	-0.55	0.078
101.00	-50.10	-4.74	0.00	-155.34	0.00	155.34	2,422.80	1,211.40	3,656.12	1,805.62	5.59	-0.56	0.107
105.00	-48.45	-4.64	0.00	-136.39	0.00	136.39	2,386.99	1,193.50	3,503.58	1,730.29	6.07	-0.58	0.099
110.00	-46.42	-4.53	0.00	-113.18	0.00	113.18	2,339.89	1,169.95	3,313.74	1,636.53	6.69	-0.61	0.089
115.00	-42.08	-4.10	0.00	-90.51	0.00	90.51	2,290.19	1,145.09	3,125.21	1,543.42	7.34	-0.64	0.077
120.00	-40.34	-4.02	0.00	-70.01	0.00	70.01	2,237.88	1,118.94	2,938.39	1,451.16	8.02	-0.66	0.066
122.00	-33.85	-3.34	0.00	-61.98	0.00	61.98	2,216.23	1,108.11	2,864.23	1,414.54	8.30	-0.67	0.059
125.00	-32.87	-3.26	0.00	-51.95	0.00	51.95	2,182.97	1,091.48	2,753.68	1,359.94	8.73	-0.68	0.053
130.00	-31.27	-3.17	0.00	-35.68	0.00	35.68	2,125.45	1,062.72	2,571.49	1,269.96	9.45	-0.70	0.043
132.00	-23.74	-2.39	0.00	-29.34	0.00	29.34	2,101.71	1,050.86	2,499.41	1,234.36	9.74	-0.70	0.035
135.00	-23.01	-2.34	0.00	-22.18	0.00	22.18	2,065.33	1,032.66	2,392.21	1,181.42	10.19	-0.71	0.030
136.00	-14.80	-1.43	0.00	-19.84	0.00	19.84	2,052.99	1,026.50	2,356.75	1,163.91	10.34	-0.71	0.024
140.00	-13.92	-1.34	0.00	-14.10	0.00	14.10	1,995.72	997.86	2,208.65	1,090.77	10.94	-0.72	0.020
145.00	-12.86	-1.24	0.00	-7.40	0.00	7.40	1,903.76	951.88	2,008.67	992.01	11.70	-0.73	0.014
150.00	0.00	-1.07	0.00	-1.22	0.00	1.22	1,811.80	905.90	1,818.18	897.93	12.46	-0.73	0.001

Load Case: 1.0D + 1.0W Serviceability 60 mph 20 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		105.7	0.0					0.0	0.0	105.7	0.0	0.0	0.0
5.00		209.3	1,626.6					0.0	1.1	209.3	1,627.7	0.0	0.0
10.00		204.9	1,592.6					0.0	258.5	204.9	1,851.0	0.0	0.0
15.00		203.6	1,558.6					0.0	258.5	203.6	1,817.1	0.0	0.0
20.00		207.8	1,524.7					0.0	258.5	207.8	1,783.1	0.0	0.0
25.00		213.0	1,490.7					0.0	258.5	213.0	1,749.2	0.0	0.0
30.00		216.4	1,456.7					0.0	258.5	216.4	1,715.2	0.0	0.0
35.00		218.3	1,422.8					0.0	258.5	218.3	1,681.2	0.0	0.0
40.00		219.2	1,388.8					0.0	258.5	219.2	1,647.3	0.0	0.0
45.00		155.4	1,354.8					0.0	258.5	155.4	1,613.3	0.0	0.0
47.08	Bot - Section 2	110.6	554.5					0.0	107.7	110.6	662.2	0.0	0.0
50.00		153.6	1,400.5					0.0	150.8	153.6	1,551.2	0.0	0.0
54.00	Top - Section 1	110.8	1,886.6					0.0	206.8	110.8	2,093.3	0.0	0.0
55.00		132.2	210.8					0.0	51.7	132.2	262.5	0.0	0.0
60.00		219.2	1,037.6					0.0	258.5	219.2	1,296.0	0.0	0.0
65.00		217.0	1,010.0					0.0	258.5	217.0	1,268.4	0.0	0.0
70.00		214.3	982.4					0.0	258.5	214.3	1,240.8	0.0	0.0
75.00		211.3	954.8					0.0	258.5	211.3	1,213.3	0.0	0.0
80.00		208.0	927.2					0.0	258.5	208.0	1,185.7	0.0	0.0
85.00		204.4	899.7					0.0	258.5	204.4	1,158.1	0.0	0.0
90.00		200.5	872.1					0.0	258.5	200.5	1,130.5	0.0	0.0
95.00		109.0	844.5					0.0	258.5	109.0	1,103.0	0.0	0.0
95.50	Bot - Section 3	98.6	82.9					0.0	25.8	98.6	108.8	0.0	0.0
100.00		108.2	1,310.0					0.0	232.6	108.2	1,542.6	0.0	0.0
101.00	Top - Section 2	96.5	285.7					0.0	51.7	96.5	337.4	0.0	0.0
105.00		171.2	494.2					0.0	206.8	171.2	701.0	0.0	0.0
110.00		185.9	598.6					0.0	258.5	185.9	857.1	0.0	0.0
115.00	Appurtenance(s)	180.9	577.4	448.1	0.0	0.0	797.1	0.0	258.5	629.1	1,633.0	0.0	0.0
120.00		124.2	556.2					0.0	235.8	124.2	792.0	0.0	0.0
122.00	Appurtenance(s)	86.6	216.5	826.0	0.0	0.0	2,270.0	0.0	94.3	912.6	2,580.8	0.0	0.0
125.00		135.5	318.4					0.0	112.0	135.5	430.4	0.0	0.0
130.00		116.7	513.7					0.0	186.6	116.7	700.3	0.0	0.0
132.00	Appurtenance(s)	81.1	199.5	829.5	0.0	0.0	2,622.4	0.0	74.6	910.6	2,896.6	0.0	0.0
135.00		64.2	293.0					0.0	86.4	64.2	379.4	0.0	0.0
136.00	Appurtenance(s)	78.3	96.0	1,131.2	0.0	0.0	2,622.2	0.0	28.8	1,209.5	2,747.0	0.0	0.0
140.00		137.7	375.3					0.0	64.6	137.7	439.9	0.0	0.0
145.00		147.7	450.0					0.0	80.7	147.7	530.8	0.0	0.0
150.00	Appurtenance(s)	72.4	428.8	1,644.0	0.0	2,162.2	3,575.7	0.0	80.7	1,716.3	4,085.3	0.0	0.0
								Totals:		10,808.8	50,412.4	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 20 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-50.41	-10.72	0.00	-1,113.51	0.00	1,113.51	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.153
5.00	-48.77	-10.54	0.00	-1,059.92	0.00	1,059.92	6,215.54	3,107.77	15,067.9	7,441.50	0.02	-0.03	0.150
10.00	-46.92	-10.36	0.00	-1,007.23	0.00	1,007.23	6,144.79	3,072.40	14,579.4	7,200.24	0.07	-0.07	0.148
15.00	-45.09	-10.18	0.00	-955.43	0.00	955.43	6,071.43	3,035.72	14,092.2	6,959.61	0.17	-0.11	0.145
20.00	-43.31	-10.00	0.00	-904.52	0.00	904.52	5,995.47	2,997.74	13,606.6	6,719.79	0.30	-0.14	0.142
25.00	-41.55	-9.81	0.00	-854.52	0.00	854.52	5,916.91	2,958.45	13,123.0	6,481.00	0.47	-0.18	0.139
30.00	-39.83	-9.61	0.00	-805.49	0.00	805.49	5,835.74	2,917.87	12,642.0	6,243.42	0.67	-0.22	0.136
35.00	-38.14	-9.41	0.00	-757.44	0.00	757.44	5,751.96	2,875.98	12,163.8	6,007.26	0.92	-0.25	0.133
40.00	-36.49	-9.21	0.00	-710.39	0.00	710.39	5,665.59	2,832.79	11,688.9	5,772.71	1.20	-0.29	0.130
45.00	-34.87	-9.06	0.00	-664.35	0.00	664.35	5,576.60	2,788.30	11,217.6	5,539.98	1.53	-0.33	0.126
47.08	-34.21	-8.96	0.00	-645.47	0.00	645.47	5,538.76	2,769.38	11,022.4	5,443.59	1.67	-0.34	0.125
50.00	-32.66	-8.81	0.00	-619.35	0.00	619.35	5,485.02	2,742.51	10,750.4	5,309.26	1.89	-0.37	0.123
54.00	-30.56	-8.69	0.00	-584.11	0.00	584.11	4,089.14	2,044.57	8,015.67	3,958.64	2.21	-0.40	0.155
55.00	-30.29	-8.57	0.00	-575.42	0.00	575.42	4,077.72	2,038.86	7,951.23	3,926.81	2.30	-0.41	0.154
60.00	-28.99	-8.37	0.00	-532.55	0.00	532.55	4,019.09	2,009.54	7,629.57	3,767.96	2.75	-0.45	0.149
65.00	-27.72	-8.16	0.00	-490.71	0.00	490.71	3,957.85	1,978.93	7,309.15	3,609.72	3.24	-0.50	0.143
70.00	-26.48	-7.96	0.00	-449.90	0.00	449.90	3,894.01	1,947.00	6,990.38	3,452.29	3.78	-0.54	0.137
75.00	-25.26	-7.75	0.00	-410.11	0.00	410.11	3,827.56	1,913.78	6,673.66	3,295.87	4.37	-0.58	0.131
80.00	-24.07	-7.55	0.00	-371.34	0.00	371.34	3,758.51	1,879.26	6,359.38	3,140.66	5.01	-0.63	0.125
85.00	-22.91	-7.35	0.00	-333.58	0.00	333.58	3,686.86	1,843.43	6,047.96	2,986.86	5.69	-0.67	0.118
90.00	-21.78	-7.15	0.00	-296.83	0.00	296.83	3,612.60	1,806.30	5,739.79	2,834.67	6.42	-0.71	0.111
95.00	-20.67	-7.04	0.00	-261.06	0.00	261.06	3,535.74	1,767.87	5,435.29	2,684.28	7.19	-0.76	0.103
95.50	-20.56	-6.95	0.00	-257.55	0.00	257.55	3,527.91	1,763.96	5,405.06	2,669.36	7.27	-0.76	0.102
100.00	-19.02	-6.82	0.00	-226.29	0.00	226.29	3,456.27	1,728.14	5,134.84	2,535.91	8.00	-0.80	0.095
101.00	-18.68	-6.73	0.00	-219.47	0.00	219.47	2,422.80	1,211.40	3,656.12	1,805.62	8.17	-0.80	0.129
105.00	-17.98	-6.56	0.00	-192.55	0.00	192.55	2,386.99	1,193.50	3,503.58	1,730.29	8.86	-0.83	0.119
110.00	-17.12	-6.37	0.00	-159.76	0.00	159.76	2,339.89	1,169.95	3,313.74	1,636.53	9.75	-0.88	0.105
115.00	-15.49	-5.73	0.00	-127.90	0.00	127.90	2,290.19	1,145.09	3,125.21	1,543.42	10.69	-0.92	0.090
120.00	-14.70	-5.60	0.00	-99.26	0.00	99.26	2,237.88	1,118.94	2,938.39	1,451.16	11.67	-0.95	0.075
122.00	-12.13	-4.64	0.00	-88.06	0.00	88.06	2,216.23	1,108.11	2,864.23	1,414.54	12.08	-0.96	0.068
125.00	-11.70	-4.51	0.00	-74.13	0.00	74.13	2,182.97	1,091.48	2,753.68	1,359.94	12.69	-0.98	0.060
130.00	-11.00	-4.38	0.00	-51.60	0.00	51.60	2,125.45	1,062.72	2,571.49	1,269.96	13.73	-1.01	0.046
132.00	-8.12	-3.42	0.00	-42.84	0.00	42.84	2,101.71	1,050.86	2,499.41	1,234.36	14.15	-1.01	0.039
135.00	-7.74	-3.35	0.00	-32.57	0.00	32.57	2,065.33	1,032.66	2,392.21	1,181.42	14.79	-1.02	0.031
136.00	-5.02	-2.09	0.00	-29.22	0.00	29.22	2,052.99	1,026.50	2,356.75	1,163.91	15.01	-1.03	0.028
140.00	-4.58	-1.95	0.00	-20.85	0.00	20.85	1,995.72	997.86	2,208.65	1,090.77	15.87	-1.04	0.021
145.00	-4.05	-1.79	0.00	-11.12	0.00	11.12	1,903.76	951.88	2,008.67	992.01	16.97	-1.05	0.013
150.00	0.00	-1.72	0.00	-2.16	0.00	2.16	1,811.80	905.90	1,818.18	897.93	18.07	-1.05	0.002

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.11	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07	
Long-Period Transition Period (T_L):	12	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.60	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.12	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11	
Seismic Response Coefficient (C_s):	0.04	
Upper Limit C_s	0.04	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	1.98	
Redundancy Factor (p):	1.00	
Seismic Force Distribution Exponent (k):	1.74	
Total Unfactored Dead Load:	50.41	k
Seismic Base Shear (E):	1.82	k

Load Case (1.2 + 0.2Sds) * DL + E ELFM **Seismic Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
37	147.50	510	3,047	0.025	45	624
36	142.50	531	2,989	0.024	44	650
35	138.00	440	2,343	0.019	34	539
34	135.50	125	644	0.005	9	153
33	133.50	379	1,907	0.015	28	464
32	131.00	274	1,334	0.011	20	336
31	127.50	700	3,250	0.026	48	857
30	123.50	430	1,889	0.015	28	527
29	121.00	311	1,317	0.011	19	381
28	117.50	792	3,188	0.026	47	969
27	112.50	836	3,119	0.025	46	1,023
26	107.50	857	2,955	0.024	43	1,049
25	103.00	701	2,243	0.018	33	858
24	100.50	337	1,035	0.008	15	413
23	97.75	1,543	4,507	0.036	66	1,888
22	95.25	109	304	0.002	4	133
21	92.50	1,103	2,927	0.024	43	1,350
20	87.50	1,131	2,723	0.022	40	1,384
19	82.50	1,158	2,518	0.020	37	1,418
18	77.50	1,186	2,312	0.019	34	1,451
17	72.50	1,213	2,106	0.017	31	1,485
16	67.50	1,241	1,902	0.015	28	1,519
15	62.50	1,268	1,701	0.014	25	1,553

14	57.50	1,296	1,503	0.012	22	1,586
13	54.50	263	277	0.002	4	321
12	52.00	2,093	2,037	0.016	30	2,562
11	48.54	1,551	1,339	0.011	20	1,899
10	46.04	662	521	0.004	8	811
9	42.50	1,613	1,105	0.009	16	1,975
8	37.50	1,647	907	0.007	13	2,016
7	32.50	1,681	722	0.006	11	2,058
6	27.50	1,715	551	0.004	8	2,100
5	22.50	1,749	396	0.003	6	2,141
4	17.50	1,783	261	0.002	4	2,183
3	12.50	1,817	148	0.001	2	2,224
2	7.50	1,851	62	0.001	1	2,266
1	2.50	1,628	8	0.000	0	1,992
Powerwave TT08-19DB1	150.00	66	406	0.003	6	81
Raycap DC6-48-60-0-8	150.00	16	99	0.001	1	20
Raycap DC6-48-60-18-	150.00	33	202	0.002	3	40
Andrew ETD819G-12UB	150.00	198	1,219	0.010	18	242
AlcatelLucent RRH2X6	150.00	138	850	0.007	13	169
Alcatel-Lucent RRH2x	150.00	153	942	0.008	14	187
Alcatel-Lucent RRH4X	150.00	210	1,293	0.010	19	257
Powerwave Allgon P65	150.00	53	326	0.003	5	65
Powerwave P65-16-XLH	150.00	53	326	0.003	5	65
CSS XDUO6-80-R	150.00	138	850	0.007	13	169
CSS XDUO6-80-R	150.00	138	850	0.007	13	169
Powerwave Allgon P65	150.00	118	727	0.006	11	144
Commscope JAH4-65C-R	150.00	262	1,613	0.013	24	321
Flat Platform with H	150.00	2,000	12,316	0.100	181	2,448
Commscope CBC78-DF-2	136.00	40	206	0.002	3	48
Commscope TMA-T-DB78	136.00	116	600	0.005	9	141
RFS DB-B1-6C-12AB-0Z	136.00	43	222	0.002	3	52
Ericsson RRUS B13 w/	136.00	216	1,122	0.009	17	264
Ericsson AIR 32 (57"	136.00	297	1,542	0.012	23	364
Kathrein 800 10510V0	136.00	112	584	0.005	9	138
Andrew LNX-6515DS-A1	136.00	299	1,551	0.013	23	366
Round Low Profile Pl	136.00	1,500	7,788	0.063	115	1,836
Andrew ETW200VS12UB	132.00	33	163	0.001	2	40
Nokia FRIG w/o Solar	132.00	162	799	0.006	12	198
Nokia FHFB	132.00	146	717	0.006	11	178
Raycap ASU9338TYP01	132.00	15	73	0.001	1	18
Andrew TMBX-6517-R2M	132.00	59	293	0.002	4	73
Andrew TMBXX-6517-A2	132.00	208	1,023	0.008	15	254
Round Platform w/ Ha	132.00	2,000	9,858	0.080	145	2,448
48" x 12" Panel	122.00	270	1,160	0.009	17	331
Flat Platform with H	122.00	2,000	8,595	0.070	126	2,448
DragonWave Horizon D	115.00	14	54	0.000	1	17
Samsung 2.5GHz nRRHv	115.00	152	590	0.005	9	186
Argus LLPX310R	115.00	86	333	0.003	5	105
Round Side Arm	115.00	450	1,745	0.014	26	551
Andrew VHLP2.5	115.00	48	185	0.001	3	58
Andrew VHLP2.5	115.00	48	185	0.001	3	58
		50,412	123,504	1.000	1,817	61,710

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
37	147.50	510	3,047	0.025	45	446
36	142.50	531	2,989	0.024	44	465
35	138.00	440	2,343	0.019	34	385

34	135.50	125	644	0.005	9	109
33	133.50	379	1,907	0.015	28	332
32	131.00	274	1,334	0.011	20	240
31	127.50	700	3,250	0.026	48	613
30	123.50	430	1,889	0.015	28	377
29	121.00	311	1,317	0.011	19	272
28	117.50	792	3,188	0.026	47	694
27	112.50	836	3,119	0.025	46	732
26	107.50	857	2,955	0.024	43	751
25	103.00	701	2,243	0.018	33	614
24	100.50	337	1,035	0.008	15	296
23	97.75	1,543	4,507	0.036	66	1,351
22	95.25	109	304	0.002	4	95
21	92.50	1,103	2,927	0.024	43	966
20	87.50	1,131	2,723	0.022	40	990
19	82.50	1,158	2,518	0.020	37	1,014
18	77.50	1,186	2,312	0.019	34	1,039
17	72.50	1,213	2,106	0.017	31	1,063
16	67.50	1,241	1,902	0.015	28	1,087
15	62.50	1,268	1,701	0.014	25	1,111
14	57.50	1,296	1,503	0.012	22	1,135
13	54.50	263	277	0.002	4	230
12	52.00	2,093	2,037	0.016	30	1,834
11	48.54	1,551	1,339	0.011	20	1,359
10	46.04	662	521	0.004	8	580
9	42.50	1,613	1,105	0.009	16	1,413
8	37.50	1,647	907	0.007	13	1,443
7	32.50	1,681	722	0.006	11	1,473
6	27.50	1,715	551	0.004	8	1,502
5	22.50	1,749	396	0.003	6	1,532
4	17.50	1,783	261	0.002	4	1,562
3	12.50	1,817	148	0.001	2	1,592
2	7.50	1,851	62	0.001	1	1,621
1	2.50	1,628	8	0.000	0	1,426
Powerwave TT08-19DB1	150.00	66	406	0.003	6	58
Raycap DC6-48-60-0-8	150.00	16	99	0.001	1	14
Raycap DC6-48-60-18-	150.00	33	202	0.002	3	29
Andrew ETD819G-12UB	150.00	198	1,219	0.010	18	173
AlcatelLucent RRH2X6	150.00	138	850	0.007	13	121
Alcatel-Lucent RRH2x	150.00	153	942	0.008	14	134
Alcatel-Lucent RRH4X	150.00	210	1,293	0.010	19	184
Powerwave Allgon P65	150.00	53	326	0.003	5	46
Powerwave P65-16-XLH	150.00	53	326	0.003	5	46
CSS XDUO6-80-R	150.00	138	850	0.007	13	121
CSS XDUO6-80-R	150.00	138	850	0.007	13	121
Powerwave Allgon P65	150.00	118	727	0.006	11	103
Commscope JAH4-65C-R	150.00	262	1,613	0.013	24	229
Flat Platform with H	150.00	2,000	12,316	0.100	181	1,752
Commscope CBC78-DF-2	136.00	40	206	0.002	3	35
Commscope TMA-T-DB78	136.00	116	600	0.005	9	101
RFS DB-B1-6C-12AB-0Z	136.00	43	222	0.002	3	37
Ericsson RRUS B13 w/	136.00	216	1,122	0.009	17	189
Ericsson AIR 32 (57"	136.00	297	1,542	0.012	23	260
Kathrein 800 10510V0	136.00	112	584	0.005	9	99
Andrew LNX-6515DS-A1	136.00	299	1,551	0.013	23	262
Round Low Profile Pl	136.00	1,500	7,788	0.063	115	1,314
Andrew ETW200VS12UB	132.00	33	163	0.001	2	29
Nokia FRIG w/o Solar	132.00	162	799	0.006	12	142
Nokia FHFB	132.00	146	717	0.006	11	127
Raycap ASU9338TYP01	132.00	15	73	0.001	1	13
Andrew TMBX-6517-R2M	132.00	59	293	0.002	4	52
Andrew TMBXX-6517-A2	132.00	208	1,023	0.008	15	182
Round Platform w/ Ha	132.00	2,000	9,858	0.080	145	1,752
48" x 12" Panel	122.00	270	1,160	0.009	17	236

Flat Platform with H	122.00	2,000	8,595	0.070	126	1,752
DragonWave Horizon D	115.00	14	54	0.000	1	12
Samsung 2.5GHz nRRHv	115.00	152	590	0.005	9	133
Argus LLPX310R	115.00	86	333	0.003	5	75
Round Side Arm	115.00	450	1,745	0.014	26	394
Andrew VHLP2.5	115.00	48	185	0.001	3	42
Andrew VHLP2.5	115.00	48	185	0.001	3	42
		50,412	123,504	1.000	1,817	44,156

Load Case (1.2 + 0.2Sds) * DL + E ELFM **Seismic Equivalent Lateral Forces Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-59.72	-1.82	0.00	-217.89	0.00	217.89	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.038
5.00	-57.45	-1.83	0.00	-208.79	0.00	208.79	6,215.54	3,107.77	15,067.9	7,441.50	0.00	-0.01	0.037
10.00	-55.23	-1.83	0.00	-199.66	0.00	199.66	6,144.79	3,072.40	14,579.4	7,200.24	0.01	-0.01	0.037
15.00	-53.04	-1.83	0.00	-190.51	0.00	190.51	6,071.43	3,035.72	14,092.2	6,959.61	0.03	-0.02	0.036
20.00	-50.90	-1.83	0.00	-181.35	0.00	181.35	5,995.47	2,997.74	13,606.6	6,719.79	0.06	-0.03	0.035
25.00	-48.80	-1.83	0.00	-172.19	0.00	172.19	5,916.91	2,958.45	13,123.0	6,481.00	0.09	-0.04	0.035
30.00	-46.74	-1.82	0.00	-163.05	0.00	163.05	5,835.74	2,917.87	12,642.0	6,243.42	0.13	-0.04	0.034
35.00	-44.73	-1.81	0.00	-153.93	0.00	153.93	5,751.96	2,875.98	12,163.8	6,007.26	0.18	-0.05	0.033
40.00	-42.75	-1.80	0.00	-144.86	0.00	144.86	5,665.59	2,832.79	11,688.9	5,772.71	0.24	-0.06	0.033
45.00	-41.94	-1.80	0.00	-135.86	0.00	135.86	5,576.60	2,788.30	11,217.6	5,539.98	0.30	-0.07	0.032
47.08	-40.04	-1.78	0.00	-132.11	0.00	132.11	5,538.76	2,769.38	11,022.4	5,443.59	0.33	-0.07	0.031
50.00	-37.48	-1.75	0.00	-126.93	0.00	126.93	5,485.02	2,742.51	10,750.4	5,309.26	0.38	-0.07	0.031
54.00	-37.16	-1.75	0.00	-119.93	0.00	119.93	4,089.14	2,044.57	8,015.67	3,958.64	0.44	-0.08	0.039
55.00	-35.57	-1.73	0.00	-118.19	0.00	118.19	4,077.72	2,038.86	7,951.23	3,926.81	0.46	-0.08	0.039
60.00	-34.02	-1.70	0.00	-109.56	0.00	109.56	4,019.09	2,009.54	7,629.57	3,767.96	0.55	-0.09	0.038
65.00	-32.50	-1.68	0.00	-101.04	0.00	101.04	3,957.85	1,978.93	7,309.15	3,609.72	0.65	-0.10	0.036
70.00	-31.02	-1.65	0.00	-92.65	0.00	92.65	3,894.01	1,947.00	6,990.38	3,452.29	0.76	-0.11	0.035
75.00	-29.56	-1.62	0.00	-84.40	0.00	84.40	3,827.56	1,913.78	6,673.66	3,295.87	0.88	-0.12	0.033
80.00	-28.15	-1.58	0.00	-76.32	0.00	76.32	3,758.51	1,879.26	6,359.38	3,140.66	1.01	-0.13	0.032
85.00	-26.76	-1.54	0.00	-68.41	0.00	68.41	3,686.86	1,843.43	6,047.96	2,986.86	1.15	-0.14	0.030
90.00	-25.41	-1.50	0.00	-60.70	0.00	60.70	3,612.60	1,806.30	5,739.79	2,834.67	1.29	-0.15	0.028
95.00	-25.28	-1.50	0.00	-53.20	0.00	53.20	3,535.74	1,767.87	5,435.29	2,684.28	1.45	-0.15	0.027
95.50	-23.39	-1.43	0.00	-52.45	0.00	52.45	3,527.91	1,763.96	5,405.06	2,669.36	1.47	-0.15	0.026
100.00	-22.98	-1.41	0.00	-46.02	0.00	46.02	3,456.27	1,728.14	5,134.84	2,535.91	1.62	-0.16	0.025
101.00	-22.12	-1.38	0.00	-44.61	0.00	44.61	2,422.80	1,211.40	3,656.12	1,805.62	1.65	-0.16	0.034
105.00	-21.07	-1.34	0.00	-39.09	0.00	39.09	2,386.99	1,193.50	3,503.58	1,730.29	1.79	-0.17	0.031
110.00	-20.05	-1.29	0.00	-32.42	0.00	32.42	2,339.89	1,169.95	3,313.74	1,636.53	1.97	-0.18	0.028
115.00	-18.10	-1.19	0.00	-25.97	0.00	25.97	2,290.19	1,145.09	3,125.21	1,543.42	2.16	-0.19	0.025
120.00	-17.72	-1.17	0.00	-20.01	0.00	20.01	2,237.88	1,118.94	2,938.39	1,451.16	2.36	-0.19	0.022
122.00	-14.42	-0.99	0.00	-17.66	0.00	17.66	2,216.23	1,108.11	2,864.23	1,414.54	2.44	-0.20	0.019
125.00	-13.56	-0.94	0.00	-14.68	0.00	14.68	2,182.97	1,091.48	2,753.68	1,359.94	2.57	-0.20	0.017
130.00	-13.22	-0.92	0.00	-9.97	0.00	9.97	2,125.45	1,062.72	2,571.49	1,269.96	2.78	-0.20	0.014
132.00	-9.55	-0.69	0.00	-8.12	0.00	8.12	2,101.71	1,050.86	2,499.41	1,234.36	2.87	-0.21	0.011
135.00	-9.40	-0.68	0.00	-6.05	0.00	6.05	2,065.33	1,032.66	2,392.21	1,181.42	3.00	-0.21	0.010
136.00	-5.65	-0.43	0.00	-5.37	0.00	5.37	2,052.99	1,026.50	2,356.75	1,163.91	3.04	-0.21	0.007
140.00	-5.00	-0.39	0.00	-3.64	0.00	3.64	1,995.72	997.86	2,208.65	1,090.77	3.22	-0.21	0.006
145.00	-4.38	-0.34	0.00	-1.70	0.00	1.70	1,903.76	951.88	2,008.67	992.01	3.44	-0.21	0.004
150.00	0.00	-0.32	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.18	897.93	3.66	-0.21	0.000

Load Case (0.9 - 0.2Sds) * DL + E ELFM **Seismic (Reduced DL) Equivalent Lateral Forces Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-42.73	-1.82	0.00	-215.92	0.00	215.92	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.035
5.00	-41.11	-1.82	0.00	-206.82	0.00	206.82	6,215.54	3,107.77	15,067.9	7,441.50	0.00	-0.01	0.034
10.00	-39.52	-1.83	0.00	-197.71	0.00	197.71	6,144.79	3,072.40	14,579.4	7,200.24	0.01	-0.01	0.034
15.00	-37.95	-1.83	0.00	-188.58	0.00	188.58	6,071.43	3,035.72	14,092.2	6,959.61	0.03	-0.02	0.033
20.00	-36.42	-1.82	0.00	-179.45	0.00	179.45	5,995.47	2,997.74	13,606.6	6,719.79	0.06	-0.03	0.033
25.00	-34.92	-1.82	0.00	-170.34	0.00	170.34	5,916.91	2,958.45	13,123.0	6,481.00	0.09	-0.04	0.032
30.00	-33.45	-1.81	0.00	-161.24	0.00	161.24	5,835.74	2,917.87	12,642.0	6,243.42	0.13	-0.04	0.032
35.00	-32.00	-1.80	0.00	-152.18	0.00	152.18	5,751.96	2,875.98	12,163.8	6,007.26	0.18	-0.05	0.031
40.00	-30.59	-1.79	0.00	-143.17	0.00	143.17	5,665.59	2,832.79	11,688.9	5,772.71	0.24	-0.06	0.030
45.00	-30.01	-1.78	0.00	-134.23	0.00	134.23	5,576.60	2,788.30	11,217.6	5,539.98	0.30	-0.07	0.030
47.08	-28.65	-1.76	0.00	-130.52	0.00	130.52	5,538.76	2,769.38	11,022.4	5,443.59	0.33	-0.07	0.029
50.00	-26.82	-1.73	0.00	-125.38	0.00	125.38	5,485.02	2,742.51	10,750.4	5,309.26	0.37	-0.07	0.029
54.00	-26.59	-1.73	0.00	-118.44	0.00	118.44	4,089.14	2,044.57	8,015.67	3,958.64	0.44	-0.08	0.036
55.00	-25.45	-1.71	0.00	-116.71	0.00	116.71	4,077.72	2,038.86	7,951.23	3,926.81	0.45	-0.08	0.036
60.00	-24.34	-1.69	0.00	-108.16	0.00	108.16	4,019.09	2,009.54	7,629.57	3,767.96	0.54	-0.09	0.035
65.00	-23.25	-1.66	0.00	-99.73	0.00	99.73	3,957.85	1,978.93	7,309.15	3,609.72	0.64	-0.10	0.034
70.00	-22.19	-1.63	0.00	-91.42	0.00	91.42	3,894.01	1,947.00	6,990.38	3,452.29	0.75	-0.11	0.032
75.00	-21.15	-1.60	0.00	-83.26	0.00	83.26	3,827.56	1,913.78	6,673.66	3,295.87	0.87	-0.12	0.031
80.00	-20.14	-1.56	0.00	-75.27	0.00	75.27	3,758.51	1,879.26	6,359.38	3,140.66	1.00	-0.13	0.029
85.00	-19.15	-1.52	0.00	-67.46	0.00	67.46	3,686.86	1,843.43	6,047.96	2,986.86	1.13	-0.13	0.028
90.00	-18.18	-1.48	0.00	-59.84	0.00	59.84	3,612.60	1,806.30	5,739.79	2,834.67	1.28	-0.14	0.026
95.00	-18.09	-1.48	0.00	-52.44	0.00	52.44	3,535.74	1,767.87	5,435.29	2,684.28	1.43	-0.15	0.025
95.50	-16.74	-1.41	0.00	-51.70	0.00	51.70	3,527.91	1,763.96	5,405.06	2,669.36	1.45	-0.15	0.024
100.00	-16.44	-1.39	0.00	-45.36	0.00	45.36	3,456.27	1,728.14	5,134.84	2,535.91	1.60	-0.16	0.023
101.00	-15.83	-1.36	0.00	-43.97	0.00	43.97	2,422.80	1,211.40	3,656.12	1,805.62	1.63	-0.16	0.031
105.00	-15.07	-1.32	0.00	-38.53	0.00	38.53	2,386.99	1,193.50	3,503.58	1,730.29	1.77	-0.17	0.029
110.00	-14.34	-1.27	0.00	-31.94	0.00	31.94	2,339.89	1,169.95	3,313.74	1,636.53	1.95	-0.18	0.026
115.00	-12.95	-1.18	0.00	-25.59	0.00	25.59	2,290.19	1,145.09	3,125.21	1,543.42	2.14	-0.18	0.022
120.00	-12.68	-1.16	0.00	-19.71	0.00	19.71	2,237.88	1,118.94	2,938.39	1,451.16	2.34	-0.19	0.019
122.00	-10.31	-0.98	0.00	-17.40	0.00	17.40	2,216.23	1,108.11	2,864.23	1,414.54	2.42	-0.19	0.017
125.00	-9.70	-0.93	0.00	-14.47	0.00	14.47	2,182.97	1,091.48	2,753.68	1,359.94	2.54	-0.20	0.015
130.00	-9.46	-0.91	0.00	-9.83	0.00	9.83	2,125.45	1,062.72	2,571.49	1,269.96	2.75	-0.20	0.012
132.00	-6.83	-0.68	0.00	-8.01	0.00	8.01	2,101.71	1,050.86	2,499.41	1,234.36	2.83	-0.20	0.010
135.00	-6.72	-0.67	0.00	-5.97	0.00	5.97	2,065.33	1,032.66	2,392.21	1,181.42	2.96	-0.21	0.008
136.00	-4.04	-0.43	0.00	-5.29	0.00	5.29	2,052.99	1,026.50	2,356.75	1,163.91	3.00	-0.21	0.007
140.00	-3.58	-0.38	0.00	-3.59	0.00	3.59	1,995.72	997.86	2,208.65	1,090.77	3.18	-0.21	0.005
145.00	-3.13	-0.34	0.00	-1.68	0.00	1.68	1,903.76	951.88	2,008.67	992.01	3.40	-0.21	0.003
150.00	0.00	-0.32	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.18	897.93	3.61	-0.21	0.000

Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	**0.11**
Spectral Response Acceleration at 1.0 Second Period (S_1):	**0.07**
Importance Factor (I_E):	**1.00**
Site Coefficient F_a:	**1.60**
Site Coefficient F_v	**2.40**
Response Modification Coefficient (R):	**1.50**
Design Spectral Response Acceleration at Short Period (S_{ds}):	**0.12**
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	**0.11**
Period Based on Rayleigh Method (sec):	**1.98**
Redundancy Factor (p):	**1.00**

Load Case (1.2 + 0.2Sds) * DL + E EMAM **Seismic Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
37	147.50	510	1.828	1.667	1.025	0.221	75	624
36	142.50	531	1.706	1.144	0.823	0.177	63	650
35	138.00	440	1.600	0.778	0.670	0.142	42	539
34	135.50	125	1.542	0.611	0.595	0.124	10	153
33	133.50	379	1.497	0.494	0.539	0.111	28	464
32	131.00	274	1.442	0.367	0.476	0.096	18	336
31	127.50	700	1.366	0.222	0.397	0.077	36	857
30	123.50	430	1.281	0.095	0.320	0.059	17	527
29	121.00	311	1.230	0.035	0.278	0.049	10	381
28	117.50	792	1.160	-0.030	0.226	0.038	20	969
27	112.50	836	1.063	-0.088	0.165	0.025	14	1,023
26	107.50	857	0.971	-0.116	0.117	0.017	10	1,049
25	103.00	701	0.891	-0.122	0.084	0.013	6	858
24	100.50	337	0.848	-0.119	0.069	0.012	3	413
23	97.75	1,543	0.803	-0.112	0.055	0.012	12	1,888
22	95.25	109	0.762	-0.104	0.044	0.012	1	133
21	92.50	1,103	0.719	-0.092	0.034	0.013	10	1,350
20	87.50	1,131	0.643	-0.068	0.020	0.016	12	1,384
19	82.50	1,158	0.572	-0.043	0.012	0.019	15	1,418
18	77.50	1,186	0.505	-0.018	0.007	0.022	17	1,451
17	72.50	1,213	0.442	0.005	0.006	0.025	20	1,485
16	67.50	1,241	0.383	0.023	0.007	0.027	22	1,519
15	62.50	1,268	0.328	0.039	0.010	0.027	23	1,553
14	57.50	1,296	0.278	0.050	0.014	0.028	24	1,586
13	54.50	263	0.250	0.055	0.017	0.027	5	321
12	52.00	2,093	0.227	0.059	0.020	0.027	37	2,562
11	48.54	1,551	0.198	0.063	0.023	0.026	27	1,899
10	46.04	662	0.178	0.065	0.026	0.026	11	811
9	42.50	1,613	0.152	0.068	0.030	0.025	27	1,975
8	37.50	1,647	0.118	0.070	0.035	0.023	26	2,016
7	32.50	1,681	0.089	0.071	0.039	0.022	25	2,058
6	27.50	1,715	0.064	0.072	0.041	0.021	24	2,100
5	22.50	1,749	0.043	0.070	0.042	0.019	23	2,141
4	17.50	1,783	0.026	0.067	0.040	0.018	21	2,183

3	12.50	1,817	0.013	0.059	0.034	0.015	18	2,224
2	7.50	1,851	0.005	0.044	0.025	0.011	14	2,266
1	2.50	1,628	0.001	0.018	0.010	0.005	5	1,992
Powerwave TT08-	150.00	66	1.890	1.980	1.140	0.246	11	81
Raycap DC6-48-60-0-8	150.00	16	1.890	1.980	1.140	0.246	3	20
Raycap DC6-48-60-18-	150.00	33	1.890	1.980	1.140	0.246	5	40
Andrew ETD819G-12UB	150.00	198	1.890	1.980	1.140	0.246	32	242
AlcatelLucent RRH2X6	150.00	138	1.890	1.980	1.140	0.246	23	169
Alcatel-Lucent RRH2x	150.00	153	1.890	1.980	1.140	0.246	25	187
Alcatel-Lucent RRH4X	150.00	210	1.890	1.980	1.140	0.246	34	257
Powerwave Allgon P65	150.00	53	1.890	1.980	1.140	0.246	9	65
Powerwave P65-16-XLH	150.00	53	1.890	1.980	1.140	0.246	9	65
CSS XDUO6-80-R	150.00	138	1.890	1.980	1.140	0.246	23	169
CSS XDUO6-80-R	150.00	138	1.890	1.980	1.140	0.246	23	169
Powerwave Allgon P65	150.00	118	1.890	1.980	1.140	0.246	19	144
Commscope JAH4-65C-	150.00	262	1.890	1.980	1.140	0.246	43	321
Flat Platform with H	150.00	2,000	1.890	1.980	1.140	0.246	328	2,448
Commscope CBC78-	136.00	40	1.554	0.642	0.609	0.128	3	48
Commscope TMA-T-	136.00	116	1.554	0.642	0.609	0.128	10	141
RFS DB-B1-6C-12AB-0Z	136.00	43	1.554	0.642	0.609	0.128	4	52
Ericsson RRUS B13 w/	136.00	216	1.554	0.642	0.609	0.128	18	264
Ericsson AIR 32 (57"	136.00	297	1.554	0.642	0.609	0.128	25	364
Kathrein 800 10510V0	136.00	112	1.554	0.642	0.609	0.128	10	138
Andrew LNX-6515DS-A1	136.00	299	1.554	0.642	0.609	0.128	25	366
Round Low Profile Pl	136.00	1,500	1.554	0.642	0.609	0.128	128	1,836
Andrew ETW200VS12UB	132.00	33	1.464	0.415	0.501	0.102	2	40
Nokia FRIG w/o Solar	132.00	162	1.464	0.415	0.501	0.102	11	198
Nokia FHFB	132.00	146	1.464	0.415	0.501	0.102	10	178
Raycap ASU9338TYP01	132.00	15	1.464	0.415	0.501	0.102	1	18
Andrew TMBX-6517-	132.00	59	1.464	0.415	0.501	0.102	4	73
Andrew TMBXX-6517-	132.00	208	1.464	0.415	0.501	0.102	14	254
Round Platform w/ Ha	132.00	2,000	1.464	0.415	0.501	0.102	136	2,448
48" x 12" Panel	122.00	270	1.250	0.057	0.294	0.053	10	331
Flat Platform with H	122.00	2,000	1.250	0.057	0.294	0.053	71	2,448
DragonWave Horizon D	115.00	14	1.111	-0.064	0.194	0.031	0	17
Samsung 2.5GHz nRRHv	115.00	152	1.111	-0.064	0.194	0.031	3	186
Argus LLPX310R	115.00	86	1.111	-0.064	0.194	0.031	2	105
Round Side Arm	115.00	450	1.111	-0.064	0.194	0.031	9	551
Andrew VHLP2.5	115.00	48	1.111	-0.064	0.194	0.031	1	58
Andrew VHLP2.5	115.00	48	1.111	-0.064	0.194	0.031	1	58
		50,412	83.518	40.895	32.458	7.094	1,852	61,710

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
37	147.50	510	1.828	1.667	1.025	0.221	75	446
36	142.50	531	1.706	1.144	0.823	0.177	63	465
35	138.00	440	1.600	0.778	0.670	0.142	42	385
34	135.50	125	1.542	0.611	0.595	0.124	10	109
33	133.50	379	1.497	0.494	0.539	0.111	28	332
32	131.00	274	1.442	0.367	0.476	0.096	18	240
31	127.50	700	1.366	0.222	0.397	0.077	36	613
30	123.50	430	1.281	0.095	0.320	0.059	17	377
29	121.00	311	1.230	0.035	0.278	0.049	10	272
28	117.50	792	1.160	-0.030	0.226	0.038	20	694
27	112.50	836	1.063	-0.088	0.165	0.025	14	732
26	107.50	857	0.971	-0.116	0.117	0.017	10	751
25	103.00	701	0.891	-0.122	0.084	0.013	6	614

24	100.50	337	0.848	-0.119	0.069	0.012	3	296
23	97.75	1,543	0.803	-0.112	0.055	0.012	12	1,351
22	95.25	109	0.762	-0.104	0.044	0.012	1	95
21	92.50	1,103	0.719	-0.092	0.034	0.013	10	966
20	87.50	1,131	0.643	-0.068	0.020	0.016	12	990
19	82.50	1,158	0.572	-0.043	0.012	0.019	15	1,014
18	77.50	1,186	0.505	-0.018	0.007	0.022	17	1,039
17	72.50	1,213	0.442	0.005	0.006	0.025	20	1,063
16	67.50	1,241	0.383	0.023	0.007	0.027	22	1,087
15	62.50	1,268	0.328	0.039	0.010	0.027	23	1,111
14	57.50	1,296	0.278	0.050	0.014	0.028	24	1,135
13	54.50	263	0.250	0.055	0.017	0.027	5	230
12	52.00	2,093	0.227	0.059	0.020	0.027	37	1,834
11	48.54	1,551	0.198	0.063	0.023	0.026	27	1,359
10	46.04	662	0.178	0.065	0.026	0.026	11	580
9	42.50	1,613	0.152	0.068	0.030	0.025	27	1,413
8	37.50	1,647	0.118	0.070	0.035	0.023	26	1,443
7	32.50	1,681	0.089	0.071	0.039	0.022	25	1,473
6	27.50	1,715	0.064	0.072	0.041	0.021	24	1,502
5	22.50	1,749	0.043	0.070	0.042	0.019	23	1,532
4	17.50	1,783	0.026	0.067	0.040	0.018	21	1,562
3	12.50	1,817	0.013	0.059	0.034	0.015	18	1,592
2	7.50	1,851	0.005	0.044	0.025	0.011	14	1,621
1	2.50	1,628	0.001	0.018	0.010	0.005	5	1,426
Powerwave TT08-	150.00	66	1.890	1.980	1.140	0.246	11	58
Raycap DC6-48-60-0-8	150.00	16	1.890	1.980	1.140	0.246	3	14
Raycap DC6-48-60-18-	150.00	33	1.890	1.980	1.140	0.246	5	29
Andrew ETD819G-12UB	150.00	198	1.890	1.980	1.140	0.246	32	173
AlcatelLucent RRH2X6	150.00	138	1.890	1.980	1.140	0.246	23	121
Alcatel-Lucent RRH2x	150.00	153	1.890	1.980	1.140	0.246	25	134
Alcatel-Lucent RRH4X	150.00	210	1.890	1.980	1.140	0.246	34	184
Powerwave Allgon P65	150.00	53	1.890	1.980	1.140	0.246	9	46
Powerwave P65-16-XLH	150.00	53	1.890	1.980	1.140	0.246	9	46
CSS XDUO6-80-R	150.00	138	1.890	1.980	1.140	0.246	23	121
CSS XDUO6-80-R	150.00	138	1.890	1.980	1.140	0.246	23	121
Powerwave Allgon P65	150.00	118	1.890	1.980	1.140	0.246	19	103
Commscope JAH4-65C-	150.00	262	1.890	1.980	1.140	0.246	43	229
Flat Platform with H	150.00	2,000	1.890	1.980	1.140	0.246	328	1,752
Commscope CBC78-	136.00	40	1.554	0.642	0.609	0.128	3	35
Commscope TMA-T-	136.00	116	1.554	0.642	0.609	0.128	10	101
RFS DB-B1-6C-12AB-0Z	136.00	43	1.554	0.642	0.609	0.128	4	37
Ericsson RRUS B13 w/	136.00	216	1.554	0.642	0.609	0.128	18	189
Ericsson AIR 32 (57"	136.00	297	1.554	0.642	0.609	0.128	25	260
Kathrein 800 10510V0	136.00	112	1.554	0.642	0.609	0.128	10	99
Andrew LNX-6515DS-A1	136.00	299	1.554	0.642	0.609	0.128	25	262
Round Low Profile Pl	136.00	1,500	1.554	0.642	0.609	0.128	128	1,314
Andrew ETW200VS12UB	132.00	33	1.464	0.415	0.501	0.102	2	29
Nokia FRIG w/o Solar	132.00	162	1.464	0.415	0.501	0.102	11	142
Nokia FHFB	132.00	146	1.464	0.415	0.501	0.102	10	127
Raycap ASU9338TYP01	132.00	15	1.464	0.415	0.501	0.102	1	13
Andrew TMBX-6517-	132.00	59	1.464	0.415	0.501	0.102	4	52
Andrew TMBXX-6517-	132.00	208	1.464	0.415	0.501	0.102	14	182
Round Platform w/ Ha	132.00	2,000	1.464	0.415	0.501	0.102	136	1,752
48" x 12" Panel	122.00	270	1.250	0.057	0.294	0.053	10	236
Flat Platform with H	122.00	2,000	1.250	0.057	0.294	0.053	71	1,752
DragonWave Horizon D	115.00	14	1.111	-0.064	0.194	0.031	0	12
Samsung 2.5GHz nRRHv	115.00	152	1.111	-0.064	0.194	0.031	3	133
Argus LLPX310R	115.00	86	1.111	-0.064	0.194	0.031	2	75
Round Side Arm	115.00	450	1.111	-0.064	0.194	0.031	9	394
Andrew VHLP2.5	115.00	48	1.111	-0.064	0.194	0.031	1	42
Andrew VHLP2.5	115.00	48	1.111	-0.064	0.194	0.031	1	42
		50,412	83.518	40.895	32.458	7.094	1,852	44,156

Load Case **(1.2 + 0.2Sds) * DL + E EMAM** **Seismic Equivalent Modal Analysis Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-59.72	-1.85	0.00	-226.34	0.00	226.34	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.039
5.00	-57.45	-1.84	0.00	-217.09	0.00	217.09	6,215.54	3,107.77	15,067.9	7,441.50	0.00	-0.01	0.038
10.00	-55.23	-1.83	0.00	-207.88	0.00	207.88	6,144.79	3,072.40	14,579.4	7,200.24	0.02	-0.01	0.038
15.00	-53.04	-1.82	0.00	-198.72	0.00	198.72	6,071.43	3,035.72	14,092.2	6,959.61	0.03	-0.02	0.037
20.00	-50.90	-1.80	0.00	-189.63	0.00	189.63	5,995.47	2,997.74	13,606.6	6,719.79	0.06	-0.03	0.037
25.00	-48.80	-1.78	0.00	-180.63	0.00	180.63	5,916.91	2,958.45	13,123.0	6,481.00	0.10	-0.04	0.036
30.00	-46.74	-1.76	0.00	-171.72	0.00	171.72	5,835.74	2,917.87	12,642.0	6,243.42	0.14	-0.04	0.036
35.00	-44.73	-1.74	0.00	-162.91	0.00	162.91	5,751.96	2,875.98	12,163.8	6,007.26	0.19	-0.05	0.035
40.00	-42.75	-1.72	0.00	-154.21	0.00	154.21	5,665.59	2,832.79	11,688.9	5,772.71	0.25	-0.06	0.034
45.00	-41.94	-1.71	0.00	-145.61	0.00	145.61	5,576.60	2,788.30	11,217.6	5,539.98	0.32	-0.07	0.034
47.08	-40.04	-1.68	0.00	-142.05	0.00	142.05	5,538.76	2,769.38	11,022.4	5,443.59	0.35	-0.07	0.033
50.00	-37.48	-1.65	0.00	-137.14	0.00	137.14	5,485.02	2,742.51	10,750.4	5,309.26	0.39	-0.08	0.033
54.00	-37.16	-1.65	0.00	-130.55	0.00	130.55	4,089.14	2,044.57	8,015.67	3,958.64	0.46	-0.08	0.042
55.00	-35.57	-1.62	0.00	-128.90	0.00	128.90	4,077.72	2,038.86	7,951.23	3,926.81	0.48	-0.09	0.042
60.00	-34.02	-1.60	0.00	-120.79	0.00	120.79	4,019.09	2,009.54	7,629.57	3,767.96	0.58	-0.10	0.041
65.00	-32.50	-1.58	0.00	-112.77	0.00	112.77	3,957.85	1,978.93	7,309.15	3,609.72	0.68	-0.11	0.039
70.00	-31.01	-1.57	0.00	-104.85	0.00	104.85	3,894.01	1,947.00	6,990.38	3,452.29	0.80	-0.12	0.038
75.00	-29.56	-1.55	0.00	-97.01	0.00	97.01	3,827.56	1,913.78	6,673.66	3,295.87	0.93	-0.13	0.037
80.00	-28.15	-1.54	0.00	-89.26	0.00	89.26	3,758.51	1,879.26	6,359.38	3,140.66	1.07	-0.14	0.036
85.00	-26.76	-1.53	0.00	-81.56	0.00	81.56	3,686.86	1,843.43	6,047.96	2,986.86	1.22	-0.15	0.035
90.00	-25.41	-1.52	0.00	-73.92	0.00	73.92	3,612.60	1,806.30	5,739.79	2,834.67	1.38	-0.16	0.033
95.00	-25.28	-1.52	0.00	-66.31	0.00	66.31	3,535.74	1,767.87	5,435.29	2,684.28	1.55	-0.17	0.032
95.50	-23.39	-1.51	0.00	-65.55	0.00	65.55	3,527.91	1,763.96	5,405.06	2,669.36	1.57	-0.17	0.031
100.00	-22.98	-1.50	0.00	-58.78	0.00	58.78	3,456.27	1,728.14	5,134.84	2,535.91	1.73	-0.18	0.030
101.00	-22.12	-1.50	0.00	-57.27	0.00	57.27	2,422.80	1,211.40	3,656.12	1,805.62	1.77	-0.18	0.041
105.00	-21.07	-1.49	0.00	-51.28	0.00	51.28	2,386.99	1,193.50	3,503.58	1,730.29	1.93	-0.19	0.038
110.00	-20.04	-1.47	0.00	-43.84	0.00	43.84	2,339.89	1,169.95	3,313.74	1,636.53	2.13	-0.20	0.035
115.00	-18.10	-1.44	0.00	-36.47	0.00	36.47	2,290.19	1,145.09	3,125.21	1,543.42	2.35	-0.21	0.032
120.00	-17.72	-1.43	0.00	-29.29	0.00	29.29	2,237.88	1,118.94	2,938.39	1,451.16	2.58	-0.22	0.028
122.00	-14.41	-1.32	0.00	-26.44	0.00	26.44	2,216.23	1,108.11	2,864.23	1,414.54	2.67	-0.23	0.025
125.00	-13.56	-1.28	0.00	-22.49	0.00	22.49	2,182.97	1,091.48	2,753.68	1,359.94	2.82	-0.23	0.023
130.00	-13.22	-1.26	0.00	-16.10	0.00	16.10	2,125.45	1,062.72	2,571.49	1,269.96	3.06	-0.24	0.019
132.00	-9.55	-1.04	0.00	-13.57	0.00	13.57	2,101.71	1,050.86	2,499.41	1,234.36	3.16	-0.24	0.016
135.00	-9.39	-1.03	0.00	-10.46	0.00	10.46	2,065.33	1,032.66	2,392.21	1,181.42	3.32	-0.24	0.013
136.00	-5.65	-0.75	0.00	-9.43	0.00	9.43	2,052.99	1,026.50	2,356.75	1,163.91	3.37	-0.25	0.011
140.00	-5.00	-0.68	0.00	-6.44	0.00	6.44	1,995.72	997.86	2,208.65	1,090.77	3.58	-0.25	0.008
145.00	-4.37	-0.60	0.00	-3.02	0.00	3.02	1,903.76	951.88	2,008.67	992.01	3.84	-0.25	0.005
150.00	0.00	-0.59	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.18	897.93	4.10	-0.25	0.000

Load Case **(0.9 - 0.2Sds) * DL + E EMAM** **Seismic (Reduced DL) Equivalent Modal Analysis Method**

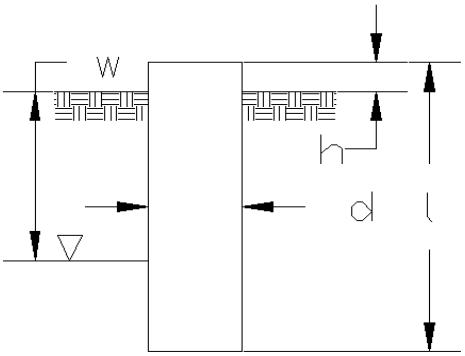
Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-42.73	-1.85	0.00	-224.18	0.00	224.18	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.036
5.00	-41.11	-1.84	0.00	-214.94	0.00	214.94	6,215.54	3,107.77	15,067.9	7,441.50	0.00	-0.01	0.035
10.00	-39.52	-1.83	0.00	-205.73	0.00	205.73	6,144.79	3,072.40	14,579.4	7,200.24	0.02	-0.01	0.035
15.00	-37.95	-1.81	0.00	-196.60	0.00	196.60	6,071.43	3,035.72	14,092.2	6,959.61	0.03	-0.02	0.035
20.00	-36.42	-1.79	0.00	-187.55	0.00	187.55	5,995.47	2,997.74	13,606.6	6,719.79	0.06	-0.03	0.034
25.00	-34.92	-1.77	0.00	-178.59	0.00	178.59	5,916.91	2,958.45	13,123.0	6,481.00	0.09	-0.04	0.033
30.00	-33.45	-1.75	0.00	-169.74	0.00	169.74	5,835.74	2,917.87	12,642.0	6,243.42	0.14	-0.04	0.033
35.00	-32.00	-1.73	0.00	-160.98	0.00	160.98	5,751.96	2,875.98	12,163.8	6,007.26	0.19	-0.05	0.032
40.00	-30.59	-1.70	0.00	-152.34	0.00	152.34	5,665.59	2,832.79	11,688.9	5,772.71	0.25	-0.06	0.032
45.00	-30.01	-1.70	0.00	-143.82	0.00	143.82	5,576.60	2,788.30	11,217.6	5,539.98	0.31	-0.07	0.031
47.08	-28.65	-1.67	0.00	-140.29	0.00	140.29	5,538.76	2,769.38	11,022.4	5,443.59	0.35	-0.07	0.031
50.00	-26.82	-1.63	0.00	-135.42	0.00	135.42	5,485.02	2,742.51	10,750.4	5,309.26	0.39	-0.08	0.030
54.00	-26.59	-1.63	0.00	-128.89	0.00	128.89	4,089.14	2,044.57	8,015.67	3,958.64	0.46	-0.08	0.039
55.00	-25.45	-1.61	0.00	-127.26	0.00	127.26	4,077.72	2,038.86	7,951.23	3,926.81	0.48	-0.09	0.039
60.00	-24.34	-1.59	0.00	-119.23	0.00	119.23	4,019.09	2,009.54	7,629.57	3,767.96	0.57	-0.10	0.038
65.00	-23.25	-1.57	0.00	-111.30	0.00	111.30	3,957.85	1,978.93	7,309.15	3,609.72	0.68	-0.11	0.037
70.00	-22.19	-1.55	0.00	-103.47	0.00	103.47	3,894.01	1,947.00	6,990.38	3,452.29	0.79	-0.12	0.036
75.00	-21.15	-1.53	0.00	-95.74	0.00	95.74	3,827.56	1,913.78	6,673.66	3,295.87	0.92	-0.13	0.035
80.00	-20.14	-1.52	0.00	-88.08	0.00	88.08	3,758.51	1,879.26	6,359.38	3,140.66	1.06	-0.14	0.033
85.00	-19.15	-1.51	0.00	-80.48	0.00	80.48	3,686.86	1,843.43	6,047.96	2,986.86	1.20	-0.15	0.032
90.00	-18.18	-1.50	0.00	-72.94	0.00	72.94	3,612.60	1,806.30	5,739.79	2,834.67	1.36	-0.16	0.031
95.00	-18.09	-1.50	0.00	-65.45	0.00	65.45	3,535.74	1,767.87	5,435.29	2,684.28	1.53	-0.17	0.029
95.50	-16.73	-1.49	0.00	-64.70	0.00	64.70	3,527.91	1,763.96	5,405.06	2,669.36	1.55	-0.17	0.029
100.00	-16.44	-1.48	0.00	-58.02	0.00	58.02	3,456.27	1,728.14	5,134.84	2,535.91	1.71	-0.18	0.028
101.00	-15.82	-1.48	0.00	-56.53	0.00	56.53	2,422.80	1,211.40	3,656.12	1,805.62	1.75	-0.18	0.038
105.00	-15.07	-1.47	0.00	-50.63	0.00	50.63	2,386.99	1,193.50	3,503.58	1,730.29	1.90	-0.19	0.036
110.00	-14.34	-1.45	0.00	-43.29	0.00	43.29	2,339.89	1,169.95	3,313.74	1,636.53	2.11	-0.20	0.033
115.00	-12.95	-1.41	0.00	-36.02	0.00	36.02	2,290.19	1,145.09	3,125.21	1,543.42	2.32	-0.21	0.029
120.00	-12.68	-1.41	0.00	-28.95	0.00	28.95	2,237.88	1,118.94	2,938.39	1,451.16	2.55	-0.22	0.026
122.00	-10.31	-1.30	0.00	-26.14	0.00	26.14	2,216.23	1,108.11	2,864.23	1,414.54	2.64	-0.22	0.023
125.00	-9.70	-1.26	0.00	-22.24	0.00	22.24	2,182.97	1,091.48	2,753.68	1,359.94	2.78	-0.23	0.021
130.00	-9.46	-1.24	0.00	-15.93	0.00	15.93	2,125.45	1,062.72	2,571.49	1,269.96	3.03	-0.24	0.017
132.00	-6.83	-1.03	0.00	-13.44	0.00	13.44	2,101.71	1,050.86	2,499.41	1,234.36	3.13	-0.24	0.014
135.00	-6.72	-1.02	0.00	-10.36	0.00	10.36	2,065.33	1,032.66	2,392.21	1,181.42	3.28	-0.24	0.012
136.00	-4.04	-0.74	0.00	-9.34	0.00	9.34	2,052.99	1,026.50	2,356.75	1,163.91	3.33	-0.24	0.010
140.00	-3.58	-0.68	0.00	-6.38	0.00	6.38	1,995.72	997.86	2,208.65	1,090.77	3.53	-0.25	0.008
145.00	-3.13	-0.60	0.00	-3.00	0.00	3.00	1,903.76	951.88	2,008.67	992.01	3.79	-0.25	0.005
150.00	0.00	-0.59	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.18	897.93	4.05	-0.25	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	40.06	0.00	60.45	0.00	0.00	4153.33	54.00	0.56
0.9D + 1.6W	38.58	0.00	45.33	0.00	0.00	3995.91	54.00	0.54
1.2D + 1.0Di + 1.0Wi	6.72	0.00	109.17	0.00	0.00	745.69	54.00	0.12
(1.2 + 0.2Sds) * DL + E ELFM	1.82	0.00	59.72	0.00	0.00	217.89	54.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	1.85	0.00	59.72	0.00	0.00	226.34	54.00	0.04
(0.9 - 0.2Sds) * DL + E ELFM	1.82	0.00	42.73	0.00	0.00	215.92	54.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	1.85	0.00	42.73	0.00	0.00	224.18	54.00	0.04
1.0D + 1.0W	10.72	0.00	50.41	0.00	0.00	1113.51	54.00	0.16

Site Name:	Woods Chapel, MO	*Program Last Updated:*	*5/13/2014*
Site Number:	306042	*American Tower Corporation*	
Engineer:	Alexander.Cartledge		
Engineering Number:	OAA720732		
Date:	01/11/18		



Design Base Loads (Factored) - Analysis per TIA-222-G Standards

Analyze or Design a Foundation?	Analyze	
Foundation Mapped:	N	
Moment (M):	4153.3	k-ft
Shear/Leg (V):	40.1	k
Axial Load (P):	60.5	k
Uplift/Leg (U):	0.0	k
Tower Type (GT / SST / MP):	MP	
Diameter of Caisson (d):	8.0	ft
Caisson Embedment (L-h):	33.0	ft
Caisson Height Above Ground (h):	0.5	ft
Depth Below Ground Surface to Water Table (w):	18.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Water:	62.4	pcf
Tension Skin Friction/Compression Skin Friction:	1.00	
Pullout Angle:	30.0	degrees

Engineer Notes

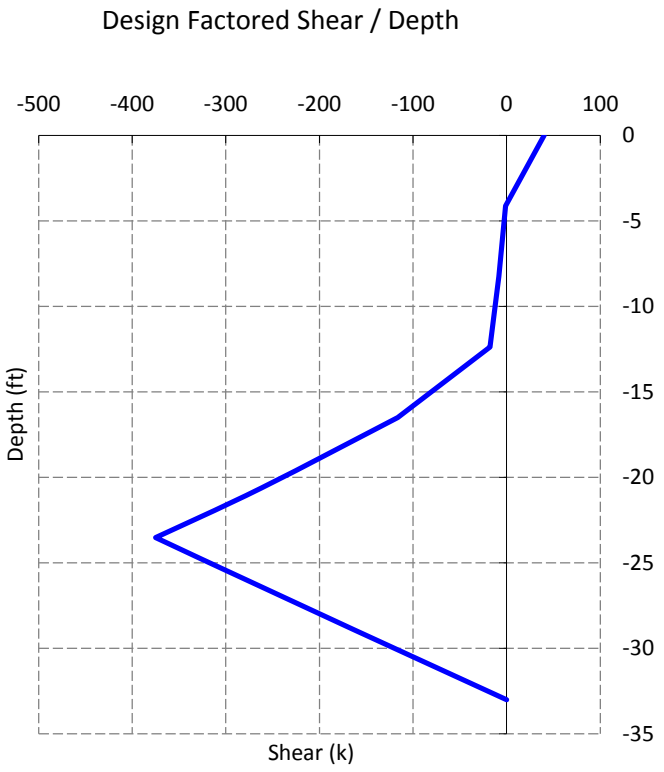
Soil Mechanical Properties

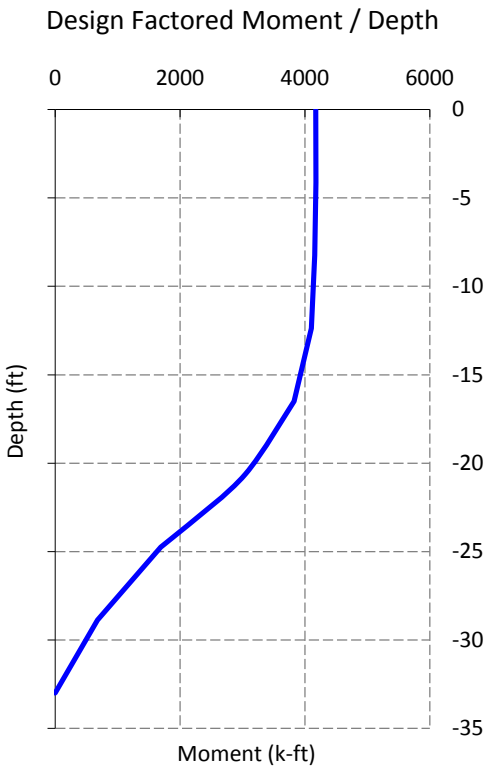
Depth (ft) Top	Depth (ft) Bottom	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)	Ultimate Skin Friction (psf)	Ultimate Bearing Pressure (psf)
0.0	4.0	100	0	0	0	0
4.0	9.5	100	250	0	134	0
9.5	15.0	136	6059	0	2727	0
15.0	18.0	139	9025	0	4061	0
18.0	34.0	140	9862	0	4438	36242

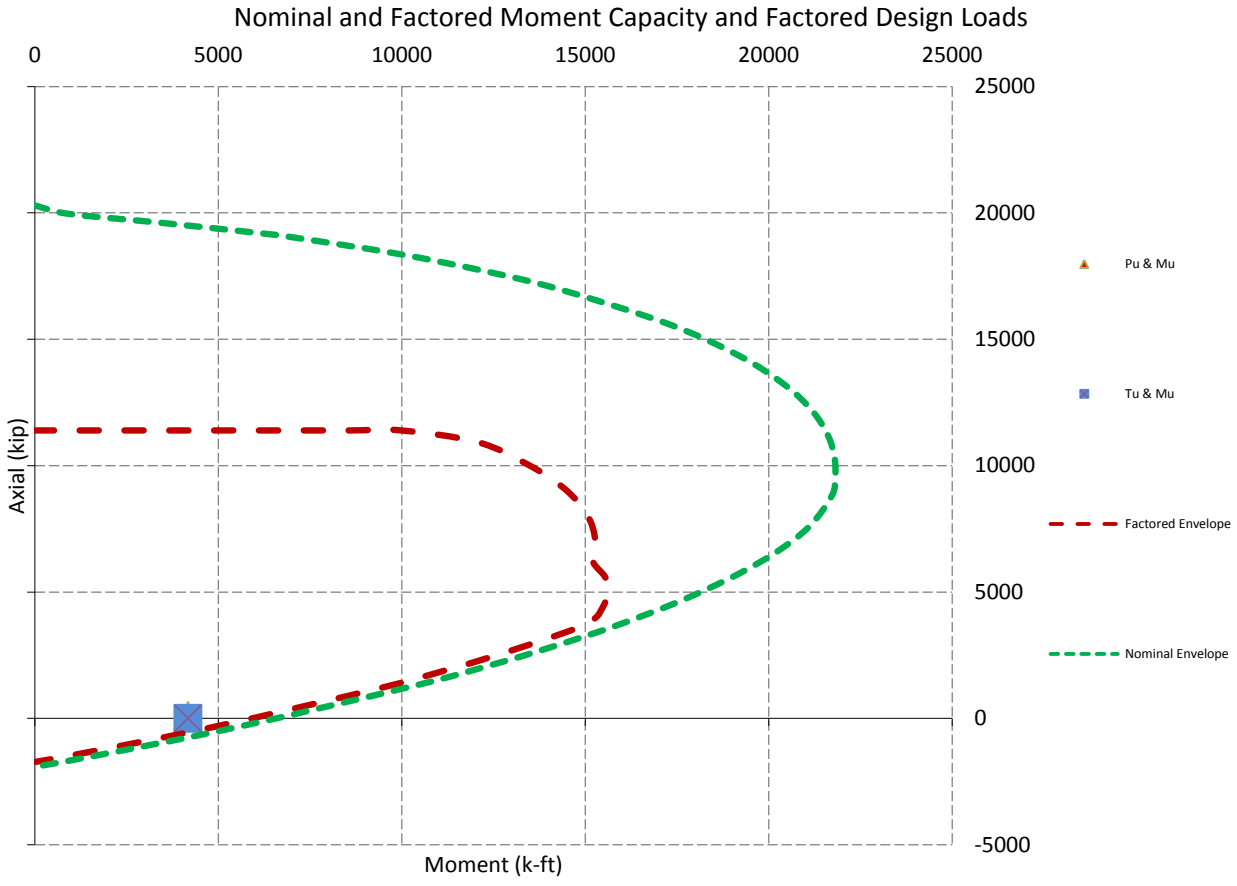
Required Embedment:	18.8	ft - OK, Caisson Embedment Satisfactory
Volume of Concrete:	1683.9	ft^3 = 62.4 yd^3
Weight of Concrete (Buoyancy Effect Considered):	205.5	k
Average Soil Unit Weight:	99.4	pcf
Skin Friction Resistance:	2374.8	k
Compressive Bearing Resistance:	1821.7	k
Pullout Weight (Minus Concrete Weight):	2031.5	k
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	1523.6	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	3147.4	k
P_u:	104.8	k
$T_u/\phi_s T_n$:	0.00	Result: OK
$P_u/\phi_s P_n$:	0.03	Result: OK
Total Lateral Resistance:	11359.5	k
Inflection Point (Below Ground Surface):	23.5	ft
Design Overturning Moment At Inflection Point (M_D):	5115.5	k-ft
Nominal Moment Capacity ($\phi_s M_n$):	43621.3	k-ft
$M_D/\phi_s M_n$:	0.12	Result: OK
ϕ_s:	0.75	

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	3000	psi
Vertical Steel Rebar Size #:	9	
Vertical Steel Rebar Area:	1.00	in^2
# of Vertical Steel Rebars:	32	
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	4	
Horizontal Tie / Stirrup Area:	0.20	in^2
Design Horizontal Tie / Stirrup Spacing:	24.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	60	ksi
Rebar Cage Diameter:	88.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression Reduction Factor (ϕ_V):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	4176.4	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	6199.9	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.67	Result: OK
Design Shear (V_u):	375.0	k
Nominal Shear Capacity ($\phi_V V_n$):	597.2	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.63	Result: OK
Design Tension (T_u):	0.0	k
Nominal Tension Capacity ($\phi_T T_n$):	1728.0	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	104.8	k
Nominal Compression Capacity ($\phi_P P_n$):	9555.5	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.01	Result: OK
Bending Reinforcement Ratio:	0.004	ACI318-05 - 10.8.4 & 10.9.1
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.67	Result: OK


Design Factored Shear / Depth
-500
-400
-300
-200
-100
0
100
0
-5
-10
-15
-20
-25
-30
-35
Depth (ft)
Shear (k)


Design Factored Moment / Depth
0
2000
4000
6000
0
-5
-10
-15
-20
-25
-30
-35
Depth (ft)
Moment (k-ft)


Nominal and Factored Moment Capacity and Factored Design Loads
0
5000
10000
15000
20000
25000
25000
20000
15000
10000
5000
0
-5000
Axial (kip)
Moment (k-ft)
Pu & Mu
Tu & Mu
Factored Envelope
Nominal Envelope

Site Number:	**306042**	*Last Updated:*	*9/1/2017*
Site Name:	**Woods Chapel, MO**		
Job Number:	**OAA720732**		
Engineer:	**Alexander.Cartledge**		
Date:	**1/11/2018**		

Base Plate and Bolt Analysis

Moment:	4153.3	k-ft
Shear/Leg:	40.1	k
Compression/Leg:	60.5	k

TIA-222 Code Revision (F/G):	G	
Anchor Bolt Arrangement:	Round	
Monopole Shaft Diameter (Across Flats):	60.5	in
Lower Monopole Thickness:	0.500	in
# of Sides of Pole:	12	
Monopole Shaft Yield Strength:	65	ksi
Baseplate Diameter / Length:	75.14	
Base Plate Thickness:	2.63	in
Base Plate Yield Strength:	60	ksi
Baseplate Detail Type:	C	
Include Plate Thickness Beyond Bolt Circle:	N	
Stress Increase:	1.00	
Fillet Weld Size:	0.500	in
Weld Type (CJP or F/F):	CJP	
Weld Strength:	70	ksi

Anchor Bolts

Anchor Bolt Yield Strength:	75	ksi
Anchor Bolt Ultimate Strength:	100	ksi
Anchor Bolt Diameter:	2.25	in
Anchor Bolt Circle:	69.14	in
# of Anchor Bolts:	12	
Minimum Anchor Bolt Separation:	6.00	in
Additional Anchor Bolts Installed:	N	

	Baseplate Flexural Capacity					Baseplate Shear Capacity			
Failure Mode:	Effective Width (in)	Moment (k-in)	S/Z (in^3)	Capacity (k-in)	Usage	Shear (k)	Area (in^2)	Capacity (k)	Usage
AA	33.47	1059.3	57.7	3113.3	**0.34**	245.2	87.9	2846.4	**0.09**
BA	29.28	797.7	50.4	2723.7	**0.29**	245.2	76.9	2490.2	**0.10**
AB	37.62	1059.3	64.8	3500.0	**0.30**	245.2	98.8	3200.0	**0.08**
BB	17.51	797.7	30.2	1629.0	**0.49**	245.2	46.0	1489.3	**0.16**

Anchor Bolt Capacity

Area of Bolt:	3.25	in^2
Inertia of Bolt:	0.84	in^4
Total Bolt Inertia:	23297.6	in^4
Maximum Bolt Tension:	235.1	k
Maximum Bolt Compression:	245.2	k
Bolt Shear:	3.3	k
Tensile Bolt Capacity:	259.8	k
Compressive Bolt Capacity:	259.8	k
Shear Bolt Capacity:	140.3	k
Interaction Equation:	**0.94**	Result:
		OK

Base Weld Capacity

Force / Weld:	13.8	k/in
Weld Capacity:	39.2	k/in
Interaction Equation:	**0.35**	Result:
		OK